

# **Fish Inventories of Mid-Atlantic and Northeast Coastal and Barrier Network Parks within Virginia, Maryland and Pennsylvania 2004 Annual Report**



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*Cover Photo:* Multi-agency crew electrofishing the upper Appomattox River within Appomattox Court House National Historical Park.

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**Fish Inventories of Mid-Atlantic and Northeast Coastal and Barrier Network Parks  
Within Virginia, Maryland and Pennsylvania  
2004 Annual Report**

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**Abstract:**

During the third year of the Mid-Atlantic Network (MIDN) Park fish species inventory, several sites within each of Fredericksburg and Spotsylvania National Military Park (FRSP), Appomattox Court House National Historical Park (APCO), and Booker T. Washington National Monument (BOWA), were resampled from among those initially sampled during 2002 and 2003 effectively completing the inventory of fish species within those three parks. Fish inventories within Valley Forge National Historical Park (VAFO) were also completed this year with the addition of a section of the Schuylkill River sampled by the Pennsylvania Fish and Boat Commission (PFBC). Also this year, the inventory was expanded to include Gettysburg National Military Park (GETT) and Eisenhower National Historic Site (EISE). Additionally, George Washington Birthplace National Monument (GEWA), a component of the Northeast Coastal and Barrier Network (NCBN), was sampled extensively during 2004 as a follow-up to the preliminary 2003 sampling effort. Multiple electrofishing techniques were employed for inventories within the MIDN parks during 2004 including backpack, towed and boat mounted gear. Towed and boat mounted gear and personnel were provided courtesy of the Virginia Department of Game and Inland Fisheries (VDGIF) and the PFBC. Sampling within the expansive aquatic habitats of GEWA was accomplished to a large degree with a cooperative

agreement with the U.S. Fish and Wildlife Service (USFWS). A variety of sampling methods were employed within GEWA including the use of fyke nets, trawls, seines, and angling gear. The combined sampling efforts within all parks during 2004 included 36 sites along 13 streams or other aquatic habitats. A total of 86 fish species were identified from over 26,000 individual fish captured at all of the sites combined during 2004. Species diversity ranged from 8 within the Schuylkill River at VAFO to 31 within streams sampled at FRSP and EISE. Within every stream that was resampled during 2004, two or more new fish species were detected in addition to the range of species encountered during the initial 2002 or 2003 site visits. The cumulative fish inventory effort from all streams and sites from all years include a total of 100 species from 44,076 individual fish captured. Cumulative fish species diversity within individual parks ranged from 8 at Thomas Stone National Historic Site (THST) to 41 at FRSP.

### Significant Findings

- The diversity and high density of fishes encountered in the red shale/sandstone/limestone streams within EISE. A total of 16,851 fish representing 31 species were captured at EISE in less than two days of electrofishing within two park streams.
- The documentation of bigeye jumprock (*Scartomyzon ariommus*), a globally rare Catostomid (sucker family) within Gills Creek at BOWA.
- Nearly one third of the fish community diversity within Gills Creek is comprised of Catostomids. A total of 10 species have been detected within the section that flows through or adjacent to BOWA.
- A population of mottled sculpin (*Cottus bairdi*) encountered in the central Piedmont (Wilderness Run, FRSP). Within Virginia, these fish are more typical of coldwater streams in the Blue Ridge and Valley and Ridge physiographic provinces. Disjunct to distant mottled sculpin population isolates within Virginia only occur within the Rappahannock and James drainages.
- A population of silverjaw minnows (*Ericymba buccata*) encountered in the upper Coastal Plain (Hazel Run, FRSP). This is the only known record of the species within the Rappahannock Drainage from the upper Coastal Plain. These fish more typically occur in the central to upper Piedmont regions of the drainage.
- The detection of introduced flathead catfish (*Pylodictus olivaris*) within the Schuylkill River section that flows through VAFO and the associated absence of a sunfish (*Lepomis*) population within the sample section. These fish have been gradually introduced into a number of Atlantic slope drainages from the Mississippi basin since the mid 1960s and have since become well established within some systems.
- A total of 34 fish species have been detected within GEWA from the sum of survey efforts over the past two years. The expansive Pope's Creek system is dominated by

white perch (*Morone americana*).

- Of the various sampling techniques employed within the Pope's Creek system including electrofishing, trawling, seining, minnow traps, eel pots, fyke nets and angling, fyke nets proved to be the most efficient technique followed by seine hauls and angling.
- There are a number of established fish populations throughout the MIDN parks that are the result of introduction. These include members of the Centrarchid family (sunfish and bass) that have been widely dispersed throughout the continental United States as the result of state sponsored stocking programs, the flathead catfish, brown trout and fathead minnows encountered within VAFO, the greenside darter and fathead minnow population encountered at EISE and all carp records.
- While there are currently no listed endangered or threatened species within any aquatic system in any of the parks sampled, several species appear on the Virginia Natural Heritage Vertebrate Watch List. There is also current concern in regards to the status of American eel populations in the eastern United States.

### **Management Recommendations**

- The park lands included in this inventory are relatively small in area and do not generally contain or otherwise have control of the headwaters of aquatic systems present. However, the aquatic systems present within many of the parks contain significant fishery resources. Many if not most streams within these parks will be affected by activities associated with development, agriculture or other disturbances further upstream. Where feasible, park staff should encourage programs and projects that result in improved water quality in areas upstream from the parks.

### **Introduction/Background**

On April 3, 2001, a scoping meeting at Richmond National Battlefield Park (RICH) was held to plan inventories of vertebrates and vascular plants in the Mid-Atlantic Network (MIDN) parks. The MIDN includes eleven national parks, primarily located within Virginia and Pennsylvania, that contain significant natural resources. An additional three Virginia/Maryland parks representing the Northeast Coastal and Barrier Network (NCBN) were also included in this assessment. In a preliminary search of existing inventory information from MIDN and NCBN parks within Virginia, many gaps were identified in the status of vertebrate groups and most notably with fish. Of ten Virginia/Maryland parks from the combined networks only two (Shenandoah National Park and Colonial National Monument) had any known inventory information for fish.

During the late summer of 2002, fish inventory efforts were initiated within five Virginia parks including Booker T. Washington National Monument (BOWA), Appomattox Court House National Historical Park (APCO), Fredericksburg and Spotsylvania National Military Park

(FRSP), RICH and Petersburg National Battlefield (PETE). Fish species inventories were completed within APCO and BOWA during 2002 due to the comparatively few streams or aquatic habitats contained within each. While most of the streams or other aquatic systems within the other three parks were sampled during 2002, specific conditions including dry sections of streambeds or the presence of large ponds deferred the sampling in such areas until 2003 (Atkinson, 2003).

During 2003, sampling within the network parks included opportunistic visits during the late spring and summer as weather and associated stream water levels allowed. Where 2002 was the last in a series of drought years extending from the late 1990s, the weather patterns of 2003 resulted in a sudden shift to the wet cycle. Sequential weather systems throughout the spring and summer months produced moderate to high precipitation levels that resulted in runoff swollen streams and extended periods of high water flows throughout the season in many of the MIDN parks. While sampling within some streams proved to be more challenging than normal due to increased water levels, there were several fair to good sampling windows that were thoroughly exploited for electrofishing. In addition to extensive resampling within some aquatic systems at RICH and FRSP and all aquatic systems within PETE during late spring and early summer, many of the aquatic systems within Valley Forge National Historical Park (VAFO) and George Washington Birthplace National Monument (GEWA) were sampled for the first time during late summer (Atkinson, 2004).

In the months prior to the 2004 field season, site assessments were conducted by Shenandoah staff of aquatic habitats present within Gettysburg National Military Park (GETT) and Eisenhower National Historic Site (EISE). Preseason planning efforts also sought to cooperatively involve the use of personnel and equipment from the Virginia Department of Game and Inland Fisheries (VDGIF) to accomplish sampling in the large stream habitats within APCO and BOWA and from the Pennsylvania Fish and Boat Commission (PFBC) to assist with large stream sampling at GETT and EISE and to accomplish sampling in the Schuylkill River within VAFO. Additionally, a cooperative agreement was established with the U.S. Fish and Wildlife Service, Gloucester Fishery Resources Office for assistance with sampling efforts at Pope's Creek within GEWA.

## **Objectives**

- Complete the documentation of 90% of fish species present within each of the MIDN and NCBN parks within Virginia, Maryland and Pennsylvania.

## **Study Area Descriptions (2004)**

### **Appomattox Court House National Historical Park**

The land area comprising Appomattox Court House National Historical Park spans an 8.4 mile section of the upper Appomattox River and several small tributaries including Plain Run Branch in the headwater region of the Appomattox River system. The park is located along the boundary of the Piedmont Lowlands and the Piedmont Foothill physiographic provinces (Jenkins

and Burkhead, 1994) and is within the James drainage in south-central Virginia. The three sections of the Appomattox River (Map 1) that were originally sampled during 2002, were resampled during mid May, 2004 to in an attempt to document additional fish species that were either not present or not detected within these sections of the stream during late summer and the low flow conditions that persisted in 2002. The original site along Plain Run Branch was not resampled this year since the original 2002 survey yielded a species mix (albeit reduced) that was also found within the adjacent river. Channel widths within the Appomattox River this year varied slightly from those initially encountered during 2002 due to increased seasonal inflow. Pool depths were obviously greater during the spring, 2004 sample than in 2002. Dominant river substrates included bedrock formations, cobble, gravel, pebble, sand, clay, and muck deposits.

### **Booker T. Washington National Monument**

The land area associated with Booker T. Washington National Monument contains an approximate 0.7 mile section of Gills Creek and an equally short section of Jack-O-Lantern Branch, a minor Gill's Creek tributary. Gills Creek, formerly a tributary of the Blackwater River, is one of several medium sized streams that currently flow into Smith Mountain Lake, which collectively are situated along the western boundary of the Piedmont Foothill physiographic province in southwestern Virginia. This small park is located within the Roanoke Drainage which ultimately drains into Albemarle Sound in northeastern North Carolina. During normal flow levels, the section of Gills Creek adjacent to the park has an average width of 8.7 meters. The entire section of Gill's Creek that flows through or adjacent to the park was sampled during mid May, 2004 in an attempt to document additional fish species that were either not present or not detected within this section of the stream during late summer and the low flow conditions that persisted in 2002. Water flows were moderate to high at the time of the May visit and associated stream turbidity was higher than optimal due to a series of recent thunderstorms within the drainage but these factors did not exceed acceptable thresholds for completing the survey as planned. Due to the sharply deep cut nature of the stream bank on both sides of the stream, channel widths within Gill's Creek this year varied only slightly from those initially encountered during 2002. Pool depths however, were obviously greater during the spring, 2004 sample than in 2002. Jack-O-Lantern Branch was not resampled this year since the original 2002 survey yielded a species mix (albeit reduced) that was also found within the adjacent section of Gill's Creek. Gills Creek flows across deposits of bedrock, clay, sand and gravel. Typical of the land area in the proximity of BOWA, there is an abundance of mica fragments present within the streambed.

### **Fredericksburg & Spotsylvania National Military Park**

The nine units comprising Fredericksburg and Spotsylvania National Military Park are stratified among portions of the upper Coastal Plain, the Piedmont Lowlands and the Piedmont Foothill physiographic provinces in north-central Virginia. The park also stratifies portions of the York and Rappahannock Drainages which are the only two of Virginia's ten major drainages that occur entirely within the state. The resulting diversity of aquatic habitats sampled included sections along Hazel Run, upper Deep Run and Wilderness Run within the Rappahannock Drainage, and upper Lewis Run, an unnamed tributary of the Ni River and a tributary of the Ponni River known locally as Lucy's Pond within the York Drainage. On February 23, 2004, the Embrey Dam on the Rappahannock River at Fredericksburg was breached per plan by U.S.

military demolition teams. For the first time since the mid 1800s upper reaches of the Rappahannock and Rapidan Rivers were once again available to upstream migrations of spawning fishes, particularly *Clupeids* (shad). During late March, 2004, opportunistic surveys for spawning shad were conducted within previously sampled sites in Hazel Run and Wilderness Run. These same sites were revisited during September to capitalize on near optimal water levels, conditions that had otherwise proven to be elusive during prior sampling attempts in 2002 and 2003. The combination of the early spring and late summer visits to these streams effectively completed fish inventory efforts within the park. Substrates within the section of Hazel Run that flows through the park are dominated by gravel and sand deposits. Substrates encountered within the section of Wilderness Run sampled are more varied including gravel, sand, clay and muck.

### **Gettysburg National Military Park**

The land area comprising Gettysburg National Military Park is situated within the Northern Piedmont physiographic province in southern Pennsylvania. Principal aquatic systems within the park include a two mile section (approximate) of Rock Creek and two Rock Creek tributaries, both named Plum Run. The westernmost Plum Run drains the southern section of the park and flows southward past the Round Tops and through the Devil's Den area prior to exiting the park. The easternmost Plum Run drains the East Cavalry Battlefield Site. Rock Creek is a principal tributary of the Monocacy River system, the only component of the Potomac drainage that extends into Pennsylvania. Sections of Rock Creek in the immediate vicinity of the park drain a mix of agricultural and urban landscapes and there is a wastewater treatment plant along the stream within the town of Gettysburg that was constructed in the mid-1980s. Both Plum Runs drain areas of limited agricultural use within areas of the park that receive moderate to heavy public use, primarily along auto tour routes. There was no literature within the park indicating any previous systematic surveys of fishes within Rock Creek or either of the Plum Runs. During the late summer visits to the park, water flow and associated turbidity were reduced to near optimal levels for fish sampling efforts. The remnants of tropical storms Bonnie and Charley had only recently either narrowly missed or grazed areas in the vicinity of the park in what eventually proved to be one of the most active tropical storm seasons of recent record in the Mid Atlantic region. The park sections of Rock Creek flow through an area dominated by large, unconsolidated diabase boulders, many of which line the streambed. In addition to the large boulder substrates, the streambed includes cobble and gravel beds composed of shale, sandstone and limestone, all covered with silt. With the exception of the large diabase boulder outcrop in the Devil's Den area, substrates within both of the Plum Runs were dominated by cobble and gravel composed of mudstone, shale, sandstone and limestone.

### **Eisenhower National Historic Site**

Adjacent to the southwestern boundary of Gettysburg Battlefield, the land area comprising the Eisenhower National Historic Site contains a 0.3 mile section of Marsh Creek and a 0.7 mile section of the Marsh Creek tributary, Willoughby Run. Marsh Creek is the other principal tributary along with Rock Creek of the Monocacy River system. Both streams drain extensive agricultural landscapes upstream of the park. Marsh Creek is a large stream with widths that vary from 5 to nearly 15 meters within the park. The upstream boundary crosses the stream in the vicinity of a municipal dam and associated impounded section. Downstream of the dam, the

channel braids around several islands which collectively reform into a single channel several hundred meters prior to exiting the park. Marsh Creek was recently (2001 and 2002) subjected to a fairly extensive fish species inventory associated with an evaluation of municipal water supply operations on aquatic habitats within the stream (Normandeau Associates, Inc, 2004). The park section of Willoughby Run flows nearly parallel to and within 0.2 miles to the east of Marsh Creek. Willoughby Run is much smaller with main channel widths averaging between 3 and 8 meters within the park section. Both streams flow across extensive red shale and sandstone substrates interspersed with thin beds of limestone. Dominant streambed substrates include cobble, gravel and areas of exposed bedrock, all covered extensively with silt. During the late summer visit to the park, water flow and associated turbidity were reduced to near optimal levels for fish sampling efforts. The remnants of tropical storms Bonnie and Charley had likewise only recently either narrowly missed or grazed areas in the vicinity of the park.

### **Valley Forge National Historical Park**

The land area comprising Valley Forge National Historical Park is situated within the Northern Piedmont physiographic province in southeastern Pennsylvania. The principal aquatic systems within the park include a three mile section (approximate) of the Schuylkill River, the lower two miles of Valley Creek including its confluence with the Schuylkill and 12 named tributaries of the two. The Schuylkill River is the largest tributary of the Delaware River, the principal aquatic system comprising the Delaware drainage that ultimately flows into Delaware Bay. Both the Schuylkill River and Valley Creek flow through heavily developed urban landscapes prior to entering the park. In addition to development associated alterations to water quality and drainage patterns, the watershed in the immediate vicinity of the park (3 miles upstream and 1 mile downstream) contain 38 point and non point sources of industrial/hazardous waste including three superfund sites. As in the case with EISE, there has been some systematic sampling for fish within the park prior to the current effort led by Shenandoah staff. Much if not all of the baseline data is associated with Valley Creek. The Pennsylvania Fish and Boat Commission (PFBC) maintains a long term monitoring transect with emphasis on the brown trout fishery on a section of Valley Creek just upstream of State Route 23. Sampling efforts associated with the MIDN fish species inventory during 2004 were limited to the three mile section of the Schuylkill River that flows through the park. The section sampled during 2004 ranged from the Route 422 bridge (downstream) to the Pawling Road Bridge (upstream). This section of the river varies between 100 and 200 meters in width, contains a mix of pool and riffle habitats and includes several islands on the downstream end.

### **George Washington Birthplace National Monument**

George Washington's Birthplace National Monument, a NCBN park, fronts the lower Potomac River within the Coastal Plain of Virginia. The tidally influenced lower Potomac River adjacent to the park is approximately six miles wide, consists primarily of brackish water and contains a diverse mix of fish species more typical of those found within Chesapeake Bay than with freshwater habitats. Along the eastern boundary, the park fronts and encompasses a portion of Pope's Creek, a fairly prominent and expansive Potomac tributary that ranges from a tidal, brackish water estuary in the vicinity of the river to a freshwater system in its upper reaches. Lower Pope's Creek contains a number of small, saltmarsh islands separated by a network of tidal channels. Great Island, located at the upstream end of the island series, is the only island

within the series that contains upland habitat that supports trees. Dancing Marsh, a tributary of Popes Creek within the park, is fed by a small stream that originates on private land adjacent to the western boundary. Bridges Creek, a much smaller Potomac tributary drains portions of the central and western area of the park. There are also several small freshwater ponds present within the park. Substrates throughout the varied aquatic systems of the park ranged primarily from firm sand in areas of high water flow to deep deposits of muck in backwater areas and ponds. Above average precipitation levels that affected the region during 2003 and in the late summer of 2004, served to decrease the salinity of even the lower reaches of Pope's Creek as evidenced by extensive milfoil beds within nearly all of the backwater areas. Fortunately, there were no precipitation related impacts associated with either of the spring or late summer fish sampling efforts other than the absence of any rays which have been observed within Pope's Creek during dry summers. The salt wedge effect and the associated intrusion of marine fish species (Murdy et al. 1997) from the Atlantic Ocean and Chesapeake Bay, is much more pronounced during drought years in the lower Potomac. The remnants of tropical storms Bonnie and Charley both resulted in significant precipitation in the park and vicinity in the weeks prior to the late summer survey. Within one week (August 31) following the late summer survey, tropical storm Gaston scored a direct hit on the park and vicinity dumping considerable rainfall.

## **Methods**

Throughout all of the wadable stream habitats within each of five of the six parks sampled during 2004, qualitative backpack electrofishing techniques were employed as described in the Shenandoah Fisheries Monitoring Protocol (Atkinson 2003). Basically, this involves either one or more electrofishing crews depending on stream width, working upstream in a line abreast formation netting every fish that enters and is affected by the electrical field(s) generated. Qualitative techniques involve a single pass through each section with the electrofishing gear as opposed to three-pass or quantitative techniques more commonly employed for population level monitoring.

Within each stream, sampling was initiated in downstream or boundary locations. When logistically possible, entire reaches of individual streams within the parks were sampled. This was possible at Gill's Creek (BOWA) and Hazel Run (FRSP). Otherwise, long stream reaches were either sampled from single or multiple large (>200m) transects in the case of Marsh Creek (EISE) and Rock Creek (GETT) or were subdivided into several 100m sections as was the case for the Appomattox River (APCO) and Plum Run – West (GETT). Within each stream, attempts were made to include major sections of representative or typical habitat and any unique habitats encountered. Sections of the Appomattox River, Marsh Creek and Rock Creek, were sufficiently wide or deep that towed electrofishing gear were used either in place of or in addition to backpack gear. Towed gear (small boat mounted generator, probes and live well), extend operator flexibility within deep and/or wide pool habitats and are therefore more effective for sampling fish within these habitats than backpack gear. The towed gear units were provided courtesy of the VDGIF for use in the Appomattox River and by the PFBC for use in Rock Creek and Marsh Creek. Sections of the Schuylkill River (VAFO) were sampled with boat mounted electrofishing gear courtesy of the PFBC.

As was the case in 2003, sampling within the expansive Pope's Creek estuary at GEWA was initiated through a cooperative agreement with the U.S. Fish and Wildlife Service (USFWS), Gloucester Fishery Resources Office. A variety of sampling gear was provided by the USFWS including a 16' boat equipped with an otter trawl, several seine nets ranging from 20' to 100' long, five fyke net traps, two hoop net traps and two eel pots were employed within Pope's Creek and Bridges Creek in attempt to access and capture as many different fish species as possible. A portion of the Shenandoah crew also employed the use of angling gear near the confluence of Pope's Creek with the Potomac River in an attempt to capture some of the larger more mobile fish species suspected of inhabiting the area.

Electrofishing was not attempted within Pope's Creek during 2004 based on the poor results obtained in 2003. Rather, the core sampling effort employed during both of the extended visits to GEWA were based on fyke net/hoop net arrays set in the lower section of Pope's Creek, along the shoreline of the Potomac River and in the mouth of Bridges Creek. Fyke/hoop nets were arranged either individually or in pairs in a variety of habitats including shallows near the shoreline, backwater areas and channels. The broad reaches of lower Pope's Creek including the main channel and sections of the adjacent Potomac River were sampled with the boat towed otter trawl. The trawl with an opening approximately 10' across was employed for a total of four sweeps of approximately 10 minutes each. Following each sweep with the trawl, captured fish were emptied into an onboard live well and then sorted and counted by species.

The shoals in and adjacent to the mouth of Pope's Creek and Bridges Creeks were sampled extensively with multiple hauls using a 20' seine. Additional seine hauls were conducted along the shoreline of the Potomac in both locations. Adjacent shoreline areas were used as processing sites for sorting and counting fish upon the conclusion of each haul.

Eel pots baited with canned cat food were set within or along the edge of the main channel in lower Pope's Creek during the August visit only. These were left in place overnight and checked the following morning.

In addition to the basic species inventory, the count data provides relative densities for each species at the time of sampling. Specimens were collected and preserved from each park as needed to aid in species identifications. All collected fish were initially fixed in formalin for at least 24 hours and then transferred to a 70% ethanol solution for long-term storage. This collection is located with the fish collection from Shenandoah National Park in the Natural Resources building at the Shenandoah National Park Headquarters. The species and origin of specimens are summarized in Appendix A. As in previous years, a small number of fish including those that could not be correctly assigned to species in the field or in the lab were examined and assigned courtesy of Dr. Robert E. Jenkins at Roanoke College.

## **Results**

A combined total of 36 sites along 13 streams were sampled during 2004 (Table 1). The total inventory effort at all of the sites, streams and parks combined resulted in a capture of 26,111 individual fish representing 86 species (Table 2). Species diversity and fish numbers encountered within each park were most influenced by a variety of the total number of streams

and sites sampled or by stream size and the associated diversity of different aquatic habitats represented within each.

### **Appomattox Court House National Historical Park**

There was considerable agreement between the fish species results of the August, 2002 survey and the May, 2004 survey from the same three sites (Map 1) on the Appomattox River. The principal difference was the detection of three species, American eel (*Anguilla rostrata*), chain pickerel (*Esox niger*) and largemouth bass (*Micropterus salmoides*) during 2004 that were not detected during 2002. All three species were captured in the long pool that extends both up and downstream of the Route 24 bridge and were more likely the result of the use of towed electrofishing gear used within this section during 2004 versus the backpack gear used during 2002. The only species not captured during the 2004 survey that was detected during 2002 was the bluntnose minnow (*Pimephales notatus*). A single bluntnose minnow, regarded as absent within the Appomattox system (Jenkins and Burkhead, 1993) was captured within the downstream APCO01 site during 2002. These fish are widely used as bait and the erratic occurrence of the species within much of Virginia is likely the result of introduction.

A total of 29 fish species were detected from the three original sample sites along the Appomattox River (Table 3.) during the May, 2004 survey. The most frequently encountered fish (over 50 total individuals) at APCO during 2004 included common shiner (*Luxilus cornutus*), johnny darter (*Etheostoma nigrum*), redbreast sunfish (*Lepomis auritus*), bluehead chub (*Nocomis leptcephalus*), swallowtail shiner (*Notropis procne*), rosefin shiner (*Lythrurus ardens*), mountain redbelly dace (*Phoxinus oreas*), fantail darter (*Etheostoma flabellare*) and, bluegill (*Lepomis macrochirus*). Redbreast sunfish outnumbered bluegill approximately 2:1. Fish species detected in low numbers (less than 5 total) included longnose dace (*Rhinichthys cataractae*), longfin darter (*Etheostoma longimanum*), American eel, northern hogsucker, chain pickerel and, stripeback darter (*Percina notogramma*). As noted during 2002, one of the highlights from the Appomattox River inventory was the diversity of darters encountered there. All four darter species (fantail, longfin, johnny and stripeback) were found together only in the lower site (APCO01). Longfins were not detected from the middle site (APCO02) and neither longfins nor stipebacks were detected in the upstream site (APCO04). In addition to the darter species detected, two other species, the shield darter (*Percina peltata*) and the glassy darter (*Etheostoma vitreum*) both occur within the upper Appomattox River (Jenkins and Burkhead, 1993) but were not detected within the park. The entire Appomattox River system is considered problematic in terms of separating johnny darters from a close relative and nearly identical appearing but separate species, the tessellated darter (*Etheostoma olmstedii*). The two species within the Appomattox River system consist of integrated, hybrid and/or differentiated fish (Jenkins and Burkhead, 1993). All of the darters examined from park sections of the river conform to the characteristic interrupted infraorbital canal of the johnny darter versus uninterrupted in the tessellated darter.

## Booker T. Washington National Monument

The fish community within Gill's Creek is unique within the MIDN for several reasons including: 1) geographic location within the Roanoke drainage which supports one of the most diverse and distinctive fish communities on the Atlantic slope of the United States (Jenkins and Burkhead, 1993); 2) the influence of introduced species from Smith Mountain Lake located approximately three miles downstream; and 3) annual spring redhorse sucker (*Moxostoma*) spawning runs composed of large numbers of individual fish representing several species. The timing of the 2004 survey during mid May resulted in the detection of six fish species including silver redhorse (*Moxostoma anisurum*), shorthead redhorse (*Moxostoma macrolepidotum*), bigeye jumprock (*Scartomyzon ariommus*), common carp (*Cyprinus carpio*), white perch (*Morone americana*) and yellow perch (*Perca flavescens*) that were not detected during the initial 2002 survey. Conversely, there were six fish species detected during 2002 that were not present within the same section sampled during 2004 that are most likely the result of differences in seasonal distribution patterns related to habitat use, spawning activity and water flow levels. The six species in this latter group include golden redhorse (*Moxostoma erythrurum*), pumpkinseed (*Lepomis gibbosus*), rosieside dace (*Clinostomus funduloides*), white shiner (*Luxilus albeolus*), creek chub (*Semotilus atromaculatus*) and, riverweed darter (*Etheostoma podostemone*).

A total of 28 fish species (Table 4) were detected from the entire reach of Gill's Creek that either flows through or adjacent to the park. The most frequently encountered species (over 50 total individuals) at BOWA during May, 2004 included bluehead chub, redbreast sunfish, crescent shiner (*Luxilus cerasinus*), spottail shiner (*Notropis hudsonius*), margined madtom (*Noturus insignis*) and, black jumprock (*Scartomyzon cervinus*). Fish species detected in low numbers (less than 5 total) included quillback (*Carpoides cyprinus*), bigeye jumprock, green sunfish (*Lepomis cyanellus*), largemouth bass, common carp, swallowtail shiner, mountain redbelly dace, bluntnose minnow, white perch, johnny darter and yellow perch. A total of 34 fish species have been recorded within the park per the combined results of the 2002 and 2004 surveys.

As noted during 2002, one of the highlights from the Gill's Creek inventory was the diversity of suckers (*Catostomidae*) encountered within the stream. From both of the surveys combined (2002 and 2004), a total of 10 *Catostomids* have been detected including quillback, northern hogsucker, Roanoke hogsucker (*Hypentelium roanokense*), black jumprock, bigeye jumprock, golden redhorse, shorthead redhorse, silver redhorse, V-lip redhorse (*Moxostoma pappillosum*) and, white sucker (*Catostomus commersonii*). Roanoke Drainage endemic species encountered within BOWA that are not generally known to occur within drainages that contain all other MIDN parks include bigeye jumprock, Roanoke hogsucker, white shiner, crescent shiner and riverweed darter. The bigeye jumprock is ranked as a globally rare species owing to its relatively small geographic range and the typically low population densities at which the species persists throughout much of its range. Within the Virginia portion of its range, the bigeye jumprock is ranked as rare to uncommon and is currently listed on the Virginia Natural Heritage Vertebrate Watch List (Roble, 2003). There are currently no proposals for elevating the protective status of the species.

## Fredericksburg & Spotsylvania National Military Park

The combined surveys of 2002, 2003 and 2004 within Fredericksburg and Spotsylvania National Military Park have resulted in the detection of the greatest number of fish species (41) encountered within any of the MIDN parks. The large species count is the result of a number of small to medium sized streams stratified from the central Piedmont to the upper Coastal Plain on each side of the Fall Zone. A total of 31 fish species were detected from individual sections of Hazel Run and Wilderness Run sampled both in the early spring and during late summer, 2004 (Table 5). The seasonally stratified surveys on these two streams resulted in the detection of several additional species including mottled sculpin (*Cottus bairdii*), gizzard shad (*Dorosoma cepedianum*), silverjaw minnow (*Ericymba buccata*) and stripeback darter.

The mottled sculpin and silverjaw minnow records within the park are particularly noteworthy. Mottled sculpin are more typical of coldwater streams in the Blue Ridge and Valley and Ridge physiographic provinces. Disjunct to distant mottled sculpin population isolates within Virginia only occur in a few scattered locations of the central Piedmont within the Rappahannock and James drainages (Jenkins and Burkhead, 1993). Within Wilderness Run, mottled sculpin were only detected during the early spring (late March) survey and may retreat to sources of spring inflow during the summer months. Silverjaw minnows were only detected within Hazel Run during the late summer (September) survey. This is the only known record of the species within the Rappahannock Drainage from the upper Coastal Plain. These fish more typically occur in the central to upper Piedmont regions of the drainage. Hazel Run originates in the lower Piedmont, flows across the fall zone and enters the Rappahannock River within the upper Coastal Plain.

Hazel Run and Wilderness Run contain the greatest diversity of fish species from among all of the other streams and aquatic systems within the park. As the results indicate (Table 5), there are dramatic seasonal differences in the distribution and densities of fish species within these streams as related to water temperature, flow levels and spawning activity. Frequently encountered species within Hazel Run (50 or more individuals detected) include fallfish (*Semotilus corporalis*), bluehead chub, American eel, white sucker and tessellated darter. Infrequently encountered fish species within Hazel Run (less than five individuals detected) include warmouth (*Lepomis gulosus*), smallmouth bass (*Micropterus dolomieu*), gizzard shad, creek chub, yellow bullhead (*Ameiurus natalis*), margined madtom and sea lamprey (*Petromyzon marinus*). The two sea lampreys captured during September were both in late stages of transformation from nonparasitic ammocoetes (larvae) to parasitic juveniles. Transformation typically takes place at age six to eight years (Jenkins and Burkhead, 1993).

Frequently encountered species within Wilderness Run include white sucker, tessellated darter, creek chubsucker (*Erimyzon oblongus*), creek chub and bluegill. Infrequently encountered species include warmouth, largemouth bass, blacknose dace (*Rhinichthys atratulus*), eastern mosquitofish (*Gambusia holbrooki*) and, stripeback darter.

## Gettysburg National Military Park

The streams within Gettysburg National Military Park were sampled for the first time during 2004 as a component of the MIDN fish species inventory. A total of 18 fish species were recorded from three principal park streams (Table 6), during the August and early September visits to the park. Rock Creek, the park's largest stream, contained the greatest diversity of fishes with 16 species encountered. The most frequently encountered species (50 or more individuals detected) include bluntnose minnow, green sunfish, white sucker and greenside darter (*Etheostoma blennioides*). Within Pennsylvania, the greenside darter and the green sunfish are regarded as native to the Ohio drainage and as probably introduced in the Potomac and other Atlantic slope drainages (Cooper, 1983). The eastern silvery minnows (*Hybognathus regius*) encountered within Rock Creek are noteworthy to the extent that Cooper does not include any Pennsylvania records from the Potomac drainage but indicates that the species is only common within some streams in the Delaware drainage. Eastern silvery minnows are shown as being broadly distributed and as native from the central Piedmont and Coastal Plain sections of the Potomac drainage within Virginia however (Jenkins and Burkhead, 1993). The only other stream within any of the MIDN parks where eastern silvery minnows have been detected is Hazel Run at FRSP.

Sections of Plum Run (west) that were sampled within the park were dominated by blacknose dace, bluntnose minnow, green sunfish and creek chub. This stream also contained the only golden shiner (*Notemigonus crysoleucas*) population detected within the park, primarily in and above the Devil's Den area. These fish are propagated extensively for use as bait and have been widely introduced both within and beyond their original range through release. The isolated nature of the golden shiner population within Plum Run is more likely the result of introduction than not.

Only three fish species (creek chub, blacknose dace and bluegill) were detected within Plum Run (east), the park section of which consists of a small, low flow channel within 0.5 mile of the source spring. Blacknose dace and creek chub persist at relatively high densities within this stream and as such, they appear to be the best adapted species within the park for exploiting the limited habitats present within small headwater streams.

Fish species encountered infrequently (less than five individuals detected) within park streams include satinfish shiner (*Cyprinella analostana*) and banded killifish (*Fundulus diaphanous*).

## Eisenhower National Historic Site

As with GETT, the streams within Eisenhower National Historic Site were sampled for the first time during 2004 as a component of the MIDN fish species inventory. A total of 16,851 individual fish representing 31 species were captured from Marsh Creek and Willoughby Run (Table 7), during the August and early September visits to the park. Both streams support the highest fish densities per area in comparison to all of the other streams and aquatic systems within the MIDN parks. The high densities encountered within Marsh Creek were largely attributable to the dominance of three fish species including bluntnose minnows (5,564 captured), central stonerollers (3,551 captured) and blacknose dace (1,213 captured). Other

species that were encountered in fairly large numbers (100 or more individuals detected) included spottail shiners, greenside darters, fantail darters, longnose dace, common shiners, green sunfish and white suckers. Fish species encountered infrequently (less than five individuals detected) within Marsh Creek include rock bass (*Ambloplites rupestris*), smallmouth bass, redbreast sunfish, yellow bullhead, fathead minnow (*Pimephales promelas*), and American eel. Two fish species encountered within Marsh Creek, comely shiners (*Notropis amoenus*) and rosyface shiners (*Notropis rubellus*) were not otherwise encountered within any other stream in any of the other MIDN parks. This is more a function of the large size of Marsh Creek in comparison to the typically smaller streams that otherwise occur within the MIDN parks since both species favor large stream habitats.

Willoughby Run, a much smaller stream, had similar fish densities per area but dominance was principally attributable to two species, banded killifish (1,710 captured) and bluntnose minnows (1,450 captured). Other fish species encountered in fair large numbers (50 or more individuals detected) within Willoughby Run included green sunfish, central stonerollers, spottail shiners, yellow bullheads and greenside darters. Fish species encountered infrequently (less than five individuals detected) within Willoughby Run included common shiners, golden shiners and longnose dace.

The common denominators in terms of the principal dietary components of the dominant species include microcrustaceans (bluntnose minnows and banded killifish), small aquatic insects (bluntnose minnows, banded killifish and blacknose dace) and algae (central stonerollers) which were likely present in large quantity during 2004. Agricultural runoff and sun exposure are likely the principal contributors of massive seasonal algal blooms. Aquatic macroinvertebrates have not likely been quantified within either of the two streams.

Bluntnose minnows are regarded by Cooper, 1983 as one of the most common minnows in Pennsylvania. Their native status within the Potomac drainage is regarded as questionable by Jenkins and Burkhead, 1993, who suspect that the current distribution and abundance of the species within the drainage probably resulted from stocking, naturalization and rapid spread.

In a recent investigation of the fish community within Marsh Creek (Normandeau Associates, Inc, 2004), a different mix of species including fantail darters and spottail shiners followed by bluntnose minnows were the most dominant species recorded from their sampling effort. This difference is probably a function of the different sampling strategies employed. The Shenandoah strategy involved the use of a combination of towed and backpack electrofishing gear which effectively spanned the entire stream channel and thus minimized the escapement of highly mobile fish species. The Normandeau group employed a fairly small crew using a towed electrofishing gear unit. Having observed the structure and behavior of the large groups of fish present within the stream, the latter technique likely resulted in considerable escapement of all but species of reduced mobility (darters).

## Valley Forge National Historical Park

A survey of the Schuylkill River section that flows through the park was accomplished courtesy of the PFBC via boat mounted electrofishing gear during early October. With average widths in excess of 100 meters, the Schuylkill River is the largest stream present within any of the MIDN parks. A total of 61 fish were actually captured during the survey representing eight species (Table 8). Many more individual fish (152) representing seven species were observed but not captured during the survey (Table 9.) A total of 213 individual fish representing 11 species resulted from combined captures and observations within the river. Species either captured or observed in the largest numbers included common carp (*Cyprinus carpio*), American shad (*Alosa sapidissima*) and channel catfish (*Ictalurus punctatus*). Carp and channel catfish are both introduced species within the Delaware drainage as are smallmouth bass and flathead catfish (*Pylodictus olivaris*). Within Pennsylvania, smallmouth bass and flathead catfish are regarded as native in the Ohio drainage and introduced elsewhere (Cooper, 1983).

Of all species encountered within the river, the flathead catfish were unexpected and were likely introduced intentionally by anglers (Mike Kaufmann, PFBC, personal comm.). The other potential sources mentioned include, 1) possible escapement from Blue Marsh Reservoir, northwest of Reading, Pennsylvania during a flood and, 2) accidental introduction associated with potential mixed lots of primarily channel catfish stock from rearing ponds in Illinois. The associated absence of any sunfish species from the river survey suggests that the flatheads have become fairly well established within that section of the Schuylkill. While juvenile flatheads feed primarily on microcrustaceans and insect larvae (Jenkins and Burkhead, 1993), adults transition to a diet that consists primarily of fish. In another reference from Jenkins and Burkhead, flatheads became the dominant mainstream predator within 15 years following introduction to the Cape Fear River, North Carolina. In this case, the severe decline in other fish species involved catfish species in particular. Within the upper James River in Virginia, redbreast sunfish populations have suffered precipitous population declines due to introduced flatheads (Larry Mohn, VDGIF, personal comm.).

Two other fish species detected within the river (American shad and shield darters), have not been otherwise encountered within any of the MIDN parks during the current inventory. The American shad encountered were fingerlings migrating downriver from June, 2004 stock associated with the shad restoration program on the Schuylkill (Mike Kaufmann, personal comm.). Shield darters have also been reported from Valley Creek (previous PFBC surveys), from Marsh Creek (EISE) and as previously mentioned, from sections of the upper Appomattox River near APCO.

## George Washington Birthplace National Monument

During 2004, the lower section of Pope's Creek was sampled extensively during late May and again in late August through a cooperative agreement with the U.S. Fish and Wildlife Service, Gloucester Fishery Resources Office. The use of fyke nets and hoop traps resulted in the capture of large numbers of fish within all of the habitats where they were employed. Seine net hauls and angling provided contrasting results and the sum of the three techniques employed during May and August effectively sampled all of the fish species present within the system during those periods. Both the total number of species and the total number of individual fish captured

were slightly higher during the May visit than the August visit (Table 10). A total of 1,358 fish representing 24 species were recorded in May and 1,170 fish representing 18 species were captured during August. A combined total of 3,140 individual fish representing 30 species were captured within the park from all techniques, sites and sampling visits during 2004. An additional four species were recorded from freshwater habitats within the park during 2003 which increases the known species count for the park to 34.

Within all of the systems sampled during 2004, white perch were clearly the dominate fish species taken from the fyke net/hoop trap arrays and are the most dominant large fish species within all of the park's estuarine habitats. Fish species diversity along the shoreline of the Potomac River was considerably reduced likely due to lack of diverse habitat structure. Large numbers of inland silversides (*Menidia beryllina*), Atlantic silversides (*Menidia menidia*) and mummichog (*Fundulus heteroclitus*) were taken from seine hauls around the delta islands in lower Pope's Creek and around the bar habitat at the mouth of the creek. Angling yielded much larger numbers of striped bass (*Morone saxatilis*) and all of the channel catfish and bluefish (*Pomatomus saltatrix*) detected during the survey. The single white catfish (*Ameiurus catus*) recorded was also the result of angling.

All of the large catfish captured (some individuals approached 30 inches in length and nearly 10 pounds in weight), proved to be channel catfish by anal ray count and shape. Blue catfish (*Ictalurus furcatus*) are reputed to exist within the Potomac River but none were detected during from the sum of survey visits. Within Virginia, blue catfish are well established within tidal sections of the Rappahannock and James Rivers via introduction.

Fish species captured during May but not in August included Atlantic menhaden (*Brevoortia tyrannus*), common carp, sheepshead minnow (*Cyprinodon variegates*), naked goby (*Gobiosoma bosc*), and northern pipefish (*Syngnathus fuscus*). Menhaden and carp were captured in fyke nets and sheepshead minnows, naked goby and northern pipefish were captured in seine hauls. Conversely, fish species captured in August but not in May included Alewife (*Alosa pseudoharengus*), Atlantic needlefish (*Strongylura marina*) and bluefish. It is also interesting to note that all of the bay anchovies (*Anchoa mitchilli*) captured, were taken with the otter trawl from channel habitats within Pope's Creek both May and August.

Sampling efforts within Bridge's Creek yielded the only black crappie (*Pomoxis nigromaculatus*) and eastern mosquitofish (*Gambusia holbrooki*) captured within the park.

## **Data Management**

During the course of the inventory, a MIDN parks MS Access XP database was created as a medium for fish species inventory data entry, storage and ultimately distribution to the individual parks. The data were entered and verified according to the data management standards established in Atkinson (2003). Additionally, data collected from the Schuylkill River within Valley Forge by the PFBC were entered into the MIDN parks database by SHEN staff during 2004. Park specific databases will be available for the individual parks involved along with the annual report.

## Discussion and Management Recommendations

The cumulative fish inventory effort from all streams and sites from all years within the two NBCN parks sampled and all MIDN parks (excluding Shenandoah), include a total of 44,076 individual fish captured representing 100 species (Table 11). Within the MIDN parks only, a total of 39,515 individual fish were captured representing 83 species. The remaining 17 species were principally estuarine fish captured within George Washington Birthplace National Monument, a NBCN park. Fish species diversity within the MIDN parks ranged from 14 at Hopewell Furnace National Historic Site (Sharpe and Keener, 2003) to 41 species at Fredericksburg and Spotsylvania National Military Park. Within the two NBCN parks sampled, Thomas Stone National Historic Site (THST) and GEWA, a total of 4,561 individual fish were captured representing 39 species. Fish species diversity within the two NBCN parks ranged from 8 at THST to 34 at GEWA.

In addition to the references to introduced fish populations above, there are a number of established fish populations throughout the MIDN parks that are the result of introduction. Of the Centrarchids found in Atlantic Slope drainages within Virginia, Maryland and Pennsylvania, rock bass, white crappie (*Pomoxis annularis*), smallmouth bass, largemouth bass (*Micropterus salmoides*), and green sunfish (*Lepomis cyanellus*), have all been introduced and are therefore outside of their original native range. All are now considered as naturalized species and generally accepted as components of the native fish fauna. Within Virginia, Warmouth (*Lepomis gulosus*) are considered native to the James Drainage but were probably introduced to the York and Rappahannock Drainages (Jenkins and Burkhead, 1994).

Rock bass are considered native to the Tennessee and Big Sandy Drainages within Virginia and to the Ohio drainage within Maryland and Pennsylvania all other populations have likely been introduced (Jenkins and Burkhead, 1993). This is also true for populations of largemouth and smallmouth bass. The original native range of the green sunfish included the Tennessee, Big Sandy and New Drainages within Virginia and the Ohio drainage within Maryland and Pennsylvania, all Atlantic slope populations having been introduced. Populations of redbreast sunfish, pumpkinseed, bluegill, mud sunfish, bluespotted sunfish, and flier are the original native Centrarchid species within the Atlantic Slope drainages of the mid Atlantic states.

Common carp were first introduced to aquatic systems in the northeastern United States in 1831 from Europe and Asia. During the 1870s, the popularity of carp within the United States increased sharply and the species was broadly propagated and released in a number of states. The earliest record of carp within Virginia waters is about 1880 (Jenkins and Burkhead, 1993).

The only population of brown trout (*Salmo trutta*) within the MIDN aside from Shenandoah National Park occurs in Valley Creek within Valley Forge National Historical Park. The native range of brown trout as summarized in Jenkins and Burkhead, is Iceland, Europe, western Asia and northwestern Africa. Brown trout were first imported to the United States in the form of fertilized eggs in 1882. These fish were gradually introduced in aquatic systems during the late 1800s and early 1900s with a sharp increase occurring between 1927 and 1930. Since 1961, the

VDGIF have maintained brown trout stocks in a number of Virginia streams and a considerable number of populations are now naturalized.

Another widely distributed species, the fathead minnow is considered native to the north-central Atlantic slope, and the Mississippi basin among other basins well outside of the MIDN. All Virginia populations (Jenkins and Burkhead, 1993) are considered to have been introduced. Although no specific references were found for Pennsylvania, it is likely that populations within southern Pennsylvania, east of the Ohio drainage and south of the Great Lakes basin, are also the result of introduction.

There were no state or federally listed threatened or endangered fish species encountered within any of the MIDN or NCBN parks as the result of this inventory. Other than the remark associated with bigeye jumprock above, two other fish, the least brook lamprey (*Lampetra aepyptera*) and the ironcolor shiner (*Notropis chalybaeus*), currently appear on the Virginia Natural Heritage Vertebrate Watch List (Roble, 2003). Both fish occur together within Beaverdam Creek at Richmond National Battlefield Park. A population of least brook lamprey was also detected within Harrison Run at Petersburg National Battlefield. None of the fish species detected within the Pennsylvania component of the MIDN were listed as species of concern with the Pennsylvania Natural Heritage Program.

There is current concern in regards to the status of American eel populations within the eastern United States due to recent observed declines in eel numbers and fishery landings in several eastern states including Virginia (Haro, et al. 2000). American eels are currently found within eight MIDN parks including APCO, FRSP, EISE, VAFO, HOFU, RICH, PETE and SHEN and both of the NCBN parks (THST and GEWA) included as components of this inventory. The highest eel densities from among all aquatic systems within all of the parks sampled were detected in Hazel Run (FRSP) and Beaverdam Creek (RICH).

The principal management issues that may impact water quality and/or fish populations within MIDN streams or aquatic systems are potential affects from activities associated with development, agriculture or other disturbances upstream of the parks. Within the MIDN parks, this is most pronounced at Valley Forge, where in addition to large scale urban developments, there are a number of sources of hazardous waste affecting the watersheds upstream. Most, if not all of the aquatic systems within the MIDN parks except for Shenandoah, originate on private, municipal or other lands upstream of each park or park unit. While it is generally acknowledged that every aquatic system within Atlantic Slope drainages have been somewhat degraded from pre-colonial conditions, the primary challenge will be to limit future degradations in an attempt to preserve and/or restore water quality and associated fish species assemblages. Where feasible, park staff should encourage programs and projects that result in improved water quality in areas upstream of individual parks or park units.

The fish species inventory from the MIDN and NCBN parks will provide park managers with a significant information base in the event that future monitoring is considered or warranted for whatever reason.

## **Recommendations for Improving/Altering the Program or Project in Future Years**

The fish inventory within MIDN and selected NCBC parks is largely complete following the 2004 field season. The only tasks remaining for 2005 include, 1) a series of visits during late winter and spring to BOWA in an attempt to provide additional documentation on the timing and intensity of the redhorse spawning runs and additional documentation including spawning activity and presence of bigeye jumprock within Gills Creek and, 2) a boat mounted electrofishing survey of lower Beaverdam Creek within Richmond Battlefield associated with a conservation easement that is currently under consideration as a potential land exchange.

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## **Tables and Figures**

Table 1. Streams Sampled within Six Mid-Atlantic and One Northeast Coastal and Barrier Network Parks during 2004.

ParkCode	Park	AreaID	AreaName	NumSites
APCO	Appomattox Court House National Historical Park	APPX	Appomattox River	3
BOWA	Booker T Washington National Monument	GILL	Gills Creek	1
EISE	Eisenhower National Historic Site	MARS	Marsh Creek	2
EISE	Eisenhower National Historic Site	WILL	Willoughby Run	1
FRSP	Fredericksburg & Spotsylvania National Military Park	HAZL	Hazel Run	1
FRSP	Fredericksburg & Spotsylvania National Military Park	WILD	Wilderness Run	1
GETT	Gettysburg National Military Park	PLUM_E	Plum Run (East)	1
GETT	Gettysburg National Military Park	PLUM_W	Plum Run (West)	3
GETT	Gettysburg National Military Park	ROCK	Rock Creek	1
GEWA	George Washington Birthplace National Monument	BRIDG	Bridge's Creek	2
GEWA	George Washington Birthplace National Monument	POPE	Popes Creek	21
GEWA	George Washington Birthplace National Monument	POTR	Potomac River	2
VAFO	Valley Forge National Historical Park	SCHR	Schuylkill River	1

Table 2. Fish Species Inventory and Capture Totals by Park during 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	GEWA	Total
Anguillidae	Eel, American	Anguilla rostrata	3	0	144	0	1	0	3	151
Aphredoderidae	Perch, Pirate	Aphredoderus sayanus	9	0	0	0	0	0	0	9
Atherinidae	Silverside, Atlantic	Menidia menidia	0	0	0	0	0	0	322	322
Atherinidae	Silverside, Inland	Menidia beryllina	0	0	0	0	0	0	152	152
Belonidae	Needlefish, Atlantic	Strongylura marina	0	0	0	0	0	0	5	5
Catostomidae	Chubsucker, Creek	Erimyzon oblongus	11	0	48	0	0	0	0	59
Catostomidae	Hogsucker, Roanoke	Hypentelium roanokense	0	6	0	0	0	0	0	6
Catostomidae	Jumprock, Bigeye	Scartomyzon ariommus	0	1	0	0	0	0	0	1
Catostomidae	Jumprock, Black	Scartomyzon cervinus	0	54	0	0	0	0	0	54
Catostomidae	Quillback	Carpiodes cyprinus	0	1	0	0	0	0	0	1
Catostomidae	Redhorse, Shorthead	Moxostoma macrolepidotum	0	26	0	0	0	0	0	26
Catostomidae	Redhorse, Silver	Moxostoma anisurum	0	23	0	0	0	0	0	23
Catostomidae	Redhorse, V-lip	Moxostoma pappillosum	0	8	0	0	0	0	0	8
Catostomidae	Hogsucker, Northern	Hypentelium nigricans	3	5	0	0	9	0	0	17
Catostomidae	Sucker, Torrent	Moxostoma rhothoecum	35	0	0	0	0	0	0	35
Catostomidae	Sucker, White	Catostomus commersonii	22	28	156	138	136	0	0	480
Centrarchidae	Bass, Largemouth	Micropterus salmoides	5	1	20	7	83	0	0	116
Centrarchidae	Bass, Rock	Ambloplites rupestris	0	0	0	0	4	0	0	4
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	5	0	2	0	3	11	0	21
Centrarchidae	Bluegill	Lepomis macrochirus	55	40	77	25	43	0	3	243
Centrarchidae	Crappie, Black	Pomoxis nigromaculatus	0	0	0	0	6	0	1	7
Centrarchidae	Pumpkinseed	Lepomis gibbosus	33	0	10	30	39	0	7	119
Centrarchidae	Sunfish, Bluespotted	Enneacanthus gloriosus	0	0	0	0	0	0	1	1
Centrarchidae	Sunfish, Green	Lepomis cyanellus	0	3	27	235	381	0	0	646
Centrarchidae	Sunfish, Redbreast	Lepomis auritus	108	104	42	8	26	0	0	288
Centrarchidae	Warmouth	Lepomis gulosus	0	0	4	0	0	0	0	4
Clupeidae	Alewife	Alosa pseudoharengus	0	0	0	0	0	0	15	15
Clupeidae	Menhaden, Atlantic	Brevoortia tyrannus	0	0	0	0	0	0	1	1
Clupeidae	Shad, American	Alosa sapidissima	0	0	0	0	0	3	0	3
Clupidae	Shad, Gizzard	Dorosoma cepedianum	0	0	1	0	0	0	20	21
Cottidae	Sculpin, Mottled	Cottus bairdii	0	0	3	0	0	0	0	3

Table 2 Continued. Fish Species Inventory and Capture Totals by Park during 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	GEWA	Total
Cyprinidae	Carp, Common	Cyprinus carpio	0	2	0	0	0	0	2	4
Cyprinidae	Chub, Bluehead	Nocomis leptocephalus	105	258	186	0	0	0	0	549
Cyprinidae	Chub, Creek	Semotilus atromaculatus	18	0	40	504	40	0	0	602
Cyprinidae	Chub, River	Nocomis micropogon	0	0	0	0	1	0	0	1
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	6	0	20	1105	1213	0	0	2344
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	1	0	41	11	357	0	0	410
Cyprinidae	Dace, Mountain Redbelly	Phoxinus oreas	69	1	0	0	0	0	0	70
Cyprinidae	Dace, Rosyside	Clinostomus funduloides	5	0	31	0	0	0	0	36
Cyprinidae	Fallfish	Semotilus corporalis	17	0	259	0	0	0	0	276
Cyprinidae	Minnow, Bluntnose	Pimephales notatus	0	3	0	318	7014	0	0	7335
Cyprinidae	Minnow, Cutlips	Exoglossum maxillingua	15	0	0	0	29	0	0	44
Cyprinidae	Minnow, Eastern Silvery	Hybognathus regius	0	0	134	12	0	0	0	146
Cyprinidae	Minnow, Fathead	Pimephales promelas	0	0	0	0	9	0	0	9
Cyprinidae	Minnow, Silverjaw	Ericymba buccata	0	0	9	0	0	0	0	9
Cyprinidae	Shiner, Comely	Notropis amoenus	0	0	0	0	47	0	0	47
Cyprinidae	Shiner, Common	Luxilus cornutus	223	0	20	0	319	0	0	562
Cyprinidae	Shiner, Crescent	Luxilus cerasinus	0	71	0	0	0	0	0	71
Cyprinidae	Shiner, Golden	Notemigonus crysoleucas	0	0	2	24	1	0	0	27
Cyprinidae	Shiner, Rosefin	Lythrurus ardens	74	23	0	0	0	0	0	97
Cyprinidae	Shiner, Rosyface	Notropis rubellus	0	0	0	0	6	0	0	6
Cyprinidae	Shiner, Satinfin	Cyprinella analostana	0	45	18	1	0	3	0	67
Cyprinidae	Shiner, Spotfin	Cyprinella spiloptera	0	0	0	0	42	0	0	42
Cyprinidae	Shiner, Spottail	Notropis hudsonius	0	67	0	0	526	19	0	612
Cyprinidae	Shiner, Swallowtail	Notropis procne	86	2	15	0	0	0	0	103
Cyprinidae	Stoneroller, Central	Campostoma anomalum	21	11	0	42	3685	0	0	3759
Cyprinodontidae	Killifish, Striped	Fundulus majalis	0	0	0	0	0	0	1	1
Cyprinodontidae	Minnow, Sheepshead	Cyprinodon variegatus	0	0	0	0	0	0	1	1
Engraulidae	Anchovy, Bay	Anchoa mitchilli	0	0	0	0	0	0	4	4
Esocidae	Pickeral, Chain	Esox niger	3	0	0	0	0	0	0	3
Fundulidae	Killifish, Banded	Fundulus diaphanus	0	0	0	2	1741	0	2	1745
Fundulidae	Mummichog	Fundulus heteroclitus	0	0	0	0	0	0	126	126

Table 2 Continued. Fish Species Inventory and Capture Totals by Park during 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	GEWA	Total
Gobiidae	Goby, Naked	Gobiosoma bosc	0	0	0	0	0	0	1	1
Ictaluridae	Bullhead, Brown	Ameiurus nebulosus	0	0	2	0	0	0	3	5
Ictaluridae	Bullhead, Yellow	Ameiurus natalis	0	0	10	5	81	0	0	96
Ictaluridae	Catfish, Channel	Ictalurus punctatus	0	0	0	0	0	17	10	27
Ictaluridae	Catfish, Flathead	Pylodictus olivaris	0	0	0	0	0	3	0	3
Ictaluridae	Catfish, White	Ameiurus catus	0	0	0	0	0	0	1	1
Ictaluridae	Madtom, Margined	Noturus insignis	33	64	2	0	34	0	0	133
Moronidae	Bass, Striped	Morone saxatilis	0	0	0	0	0	0	249	249
Moronidae	Perch, White	Morone americana	0	1	0	0	0	0	2151	2152
Paralichthyidae	Flounder, Summer	Paralichthys dentatus	0	0	0	0	0	0	10	10
Percidae	Darter, Fantail	Etheostoma flabellare	59	16	0	58	419	0	0	552
Percidae	Darter, Greenside	Etheostoma blennioides	0	0	0	62	472	0	0	534
Percidae	Darter, Johnny	Etheostoma nigrum	123	1	0	0	0	0	0	124
Percidae	Darter, Longfin	Etheostoma longimanum	2	0	0	0	0	0	0	2
Percidae	Darter, Stripeback	Percina notogramma	3	0	1	0	0	0	0	4
Percidae	Darter, Tessellated	Etheostoma olmstedii	0	0	123	0	84	4	0	211
Percidae	Perch, Yellow	Perca flavescens	0	4	0	0	0	0	2	6
Petromyzontidae	Lamprey, Sea	Petromyzon marinus	0	0	2	0	0	0	0	2
Poeciliidae	Mosquitofish, Eastern	Gambusia holbrooki	0	0	2	0	0	0	9	11
Pomatomidae	Bluefish	Pomatomus saltatrix	0	0	0	0	0	0	6	6
Percidae	Darter, Shield	Percina peltata	0	0	0	0	0	1	0	1
Sciaenidae	Spot	Leiostomus xanthurus	0	0	0	0	0	0	15	15
Soleidae	Hogchoker	Trinectes maculatus	0	0	0	0	0	0	11	11
Syngnathidae	Pipefish, Northern	Syngnathus fuscus	0	0	0	0	0	0	6	6
<b>Total # Individuals</b>			1,152	869	1,451	2,587	16,851	61	3,140	26,111
<b>Total # Taxa</b>			29	28	31	18	31	8	30	86

Table 3. Fish Species Inventory and Capture Totals from Appomattox Court House National Historical Park in 2004.

COMMONNAME	FAMILY	LATINNAME	APCO01	APCO02	APCO04	Total
Anguillidae	Eel, American	Anguilla rostrata	1	2	0	3
Aphredoderidae	Perch, Pirate	Aphredoderus sayanus	2	6	1	9
Catostomidae	Sucker, White	Catostomus commersonii	1	16	5	22
Catostomidae	Chubsucker, Creek	Erimyzon oblongus	0	10	1	11
Catostomidae	Hogsucker, Northern	Hypentelium nigricans	0	3	0	3
Catostomidae	Sucker, Torrent	Thoburnia rathoecca	16	0	19	35
Centrarchidae	Sunfish, Redbreast	Lepomis auritus	18	81	9	108
Centrarchidae	Pumpkinseed	Lepomis gibbosus	0	26	7	33
Centrarchidae	Bluegill	Lepomis macrochirus	0	48	7	55
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	5	0	0	5
Centrarchidae	Bass, Largemouth	Micropterus salmoides	0	5	0	5
Cyprinidae	Stoneroller, Central	Camptostoma anomalum	8	0	13	21
Cyprinidae	Dace, Rosyside	Clinostomus funduloides	0	3	2	5
Cyprinidae	Minnow, Cutlips	Exoglossum maxilllingua	14	0	1	15
Cyprinidae	Shiner, Common	Luxilus cornutus	105	48	70	223
Cyprinidae	Shiner, Rosefin	Lythrurus ardens	15	50	9	74
Cyprinidae	Chub, Bluehead	Nocomis leptoccephalus	41	18	46	105
Cyprinidae	Shiner, Swallowtail	Notropis procne	0	86	0	86
Cyprinidae	Dace, Mountain Redbelly	Phoxinus oreas	2	6	61	69
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	0	0	6	6
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	0	0	1	1
Cyprinidae	Chub, Creek	Semotilus atromaculatus	0	0	18	18
Cyprinidae	Fallfish	Semotilus corporalis	0	15	2	17
Esocidae	Pickeral, Chain	Esox niger	0	3	0	3
Ictaluridae	Madtom, Margined	Noturus insignis	14	4	15	33
Percidae	Darter, Fantail	Etheostoma flabellare	11	16	32	59
Percidae	Darter, Longfin	Etheostoma longimanum	2	0	0	2
Percidae	Darter, Johnny	Etheostoma nigrum	14	73	36	123
Percidae	Darter, Stripeback	Percina notogramma	1	2	0	3
<b>Total # Individuals</b>			270	521	361	1,152
<b>Total # Taxa</b>			17	21	21	29

Table 4. Fish Species Inventory and Capture Totals from Booker T. Washington National Monument in 2004.

FAMILY	COMMONNAME	LATINNAME	GILL	Total
Catostomidae	Quillback	<i>Carpiodes cyprinus</i>	1	1
Catostomidae	Sucker, White	<i>Catostomus commersonii</i>	28	28
Catostomidae	Hogsucker, Northern	<i>Hypentelium nigricans</i>	5	5
Catostomidae	Hogsucker, Roanoke	<i>Hypentelium roanokense</i>	6	6
Catostomidae	Redhorse, Silver	<i>Moxostoma anisurum</i>	23	23
Catostomidae	Redhorse, Shorthead	<i>Moxostoma macrolepidotum</i>	26	26
Catostomidae	Redhorse, V-lip	<i>Moxostoma pappillosum</i>	8	8
Catostomidae	Jumprock, Bigeye	<i>Scartomyzon ariommus</i>	1	1
Catostomidae	Jumprock, Black	<i>Scartomyzon cervinus</i>	54	54
Centrarchidae	Sunfish, Redbreast	<i>Lepomis auritus</i>	104	104
Centrarchidae	Sunfish, Green	<i>Lepomis cyanellus</i>	3	3
Centrarchidae	Bluegill	<i>Lepomis macrochirus</i>	40	40
Centrarchidae	Bass, Largemouth	<i>Micropterus salmoides</i>	1	1
Cyprinidae	Stoneroller, Central	<i>Campostoma anomalum</i>	11	11
Cyprinidae	Shiner, Satinfin	<i>Cyprinella analostana</i>	45	45
Cyprinidae	Carp, Common	<i>Cyprinus carpio</i>	2	2
Cyprinidae	Shiner, Crescent	<i>Luxilus cerasinus</i>	71	71
Cyprinidae	Shiner, Rosefin	<i>Lythrurus ardens</i>	23	23
Cyprinidae	Chub, Bluehead	<i>Nocomis leptcephalus</i>	258	258
Cyprinidae	Shiner, Spottail	<i>Notropis hudsonius</i>	67	67
Cyprinidae	Shiner, Swallowtail	<i>Notropis procne</i>	2	2
Cyprinidae	Dace, Mountain Redbelly	<i>Phoxinus oreas</i>	1	1
Cyprinidae	Minnow, Bluntnose	<i>Pimephales notatus</i>	3	3
Ictaluridae	Madtom, Margined	<i>Noturus insignis</i>	64	64
Moronidae	Perch, White	<i>Morone americana</i>	1	1
Percidae	Darter, Fantail	<i>Etheostoma flabellare</i>	16	16
Percidae	Darter, Johnny	<i>Etheostoma nigrum</i>	1	1
Percidae	Perch, Yellow	<i>Perca flavescens</i>	4	4
<b>Total # Individuals</b>			<b>869</b>	<b>869</b>
<b>Total # Taxa</b>			<b>28</b>	<b>28</b>

Table 5. Fish Species Inventory and Capture Totals from Fredericksburg and Spotsylvania National Military Park in 2004.

FAMILY	COMMONNAME	LATINNAME	HAZL SPR	HAZL SUM	WILD SPR	WILD SUM	Total
Anguillidae	Eel, American	Anguilla rostrata	15	129	0	0	144
Catostomidae	Sucker, White	Catostomus commersonii	6	95	2	53	156
Catostomidae	Chubsucker, Creek	Erimyzon oblongus	1	6	0	41	48
Centrarchidae	Sunfish, Redbreast	Lepomis auritus	1	31	0	10	42
Centrarchidae	Sunfish, Green	Lepomis cyanellus	0	15	0	12	27
Centrarchidae	Pumpkinseed	Lepomis gibbosus	0	5	0	5	10
Centrarchidae	Warmouth	Lepomis gulosus	0	2	0	2	4
Centrarchidae	Bluegill	Lepomis macrochirus	3	35	2	37	77
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	0	2	0	0	2
Centrarchidae	Bass, Largemouth	Micropterus salmoides	0	16	0	4	20
Clupidae	Shad, Gizzard	Dorosoma cepedianum	0	1	0	0	1
Cottidae	Sculpin, Mottled	Cottus bairdii	0	0	3	0	3
Cyprinidae	Dace, Rosyside	Clinostomus funduloides	4	5	0	22	31
Cyprinidae	Shiner, Satinfin	Cyprinella analostana	14	4	0	0	18
Cyprinidae	Minnow, Silverjaw	Ericymba buccata	0	9	0	0	9
Cyprinidae	Minnow, Eastern Silvery	Hybognathus regius	110	24	0	0	134
Cyprinidae	Shiner, Common	Luxilus cornutus	3	5	0	12	20
Cyprinidae	Chub, Bluehead	Nocomis leptocephalus	12	142	2	30	186
Cyprinidae	Shiner, Golden	Notemigonus crysoleucas	2	0	0	0	2
Cyprinidae	Shiner, Swallowtail	Notropis procne	4	11	0	0	15
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	2	10	5	3	20
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	2	32	1	6	41
Cyprinidae	Chub, Creek	Semotilus atromaculatus	0	3	0	37	40
Cyprinidae	Fallfish	Semotilus corporalis	14	223	0	22	259
Ictaluridae	Bullhead, Yellow	Ameiurus natalis	0	2	0	8	10
Ictaluridae	Bullhead, Brown	Ameiurus nebulosus	1	0	1	0	2
Ictaluridae	Madtom, Margined	Noturus insignis	0	2	0	0	2
Percidae	Darter, Tessellated	Etheostoma olmstedi	2	51	22	48	123
Percidae	Darter, Stripeback	Percina notogramma	0	0	0	1	1
Petromyzontidae	Lamprey, Sea	Petromyzon marinus	0	2	0	0	2
Poeciliidae	Mosquitofish, Eastern	Gambusia holbrooki	0	0	0	2	2
<b>Total # Individuals</b>			196	862	38	355	1,451
<b>Total # Taxa</b>			17	26	8	19	31

Table 6. Fish Species Inventory and Capture Totals from Gettysburg National Military Park in 2004.

FAMILY	COMMONNAME	LATINNAME	ROCK	PLUM_E	PLUM_W	Total
Catostomidae	Sucker, White	Catostomus commersonii	98	0	40	138
Centrarchidae	Sunfish, Redbreast	Lepomis auritus	8	0	0	8
Centrarchidae	Sunfish, Green	Lepomis cyanellus	114	0	121	235
Centrarchidae	Pumpkinseed	Lepomis gibbosus	30	0	0	30
Centrarchidae	Bluegill	Lepomis macrochirus	9	16	0	25
Centrarchidae	Bass, Largemouth	Micropterus salmoides	6	0	1	7
Cyprinidae	Stoneroller, Central	Campostoma anomalum	32	0	10	42
Cyprinidae	Shiner, Satinfin	Cyprinella analostana	1	0	0	1
Cyprinidae	Minnow, Eastern Silvery	Hybognathus regius	12	0	0	12
Cyprinidae	Shiner, Golden	Notemigonus crysoleucas	0	0	24	24
Cyprinidae	Minnow, Bluntnose	Pimephales notatus	122	0	196	318
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	0	449	656	1105
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	11	0	0	11
Cyprinidae	Chub, Creek	Semotilus atromaculatus	16	424	64	504
Fundulidae	Killifish, Banded	Fundulus diaphanus	2	0	0	2
Ictaluridae	Bullhead, Yellow	Ameiurus natalis	5	0	0	5
Percidae	Darter, Greenside	Etheostoma blennioides	62	0	0	62
Percidae	Darter, Fantail	Etheostoma flabellare	4	0	54	58
<b>Total # Individuals</b>			532	889	1,166	2,587
<b>Total # Taxa</b>			16	3	9	18

Table 7. Fish Species Inventory and Capture Totals from Eisenhower National Historic Site in 2004.

FAMILY	COMMONNAME	LATINNAME	MARS	WILL	Total
Anguillidae	Eel, American	Anguilla rostrata	1	0	1
Catostomidae	Sucker, White	Catostomus commersonii	108	28	136
Catostomidae	Hogsucker, Northern	Hypentelium nigricans	9	0	9
Centrarchidae	Bass, Rock	Ambloplites rupestris	4	0	4
Centrarchidae	Sunfish, Redbreast	Lepomis auritus	2	24	26
Centrarchidae	Sunfish, Green	Lepomis cyanellus	121	260	381
Centrarchidae	Pumpkinseed	Lepomis gibbosus	27	12	39
Centrarchidae	Bluegill	Lepomis macrochirus	37	6	43
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	3	0	3
Centrarchidae	Bass, Largemouth	Micropterus salmoides	59	24	83
Centrarchidae	Crappie, Black	Pomoxis nigromaculatus	6	0	6
Cyprinidae	Stoneroller, Central	Campostoma anomalum	3551	134	3685
Cyprinidae	Shiner, Spotfin	Cyprinella spiloptera	33	9	42
Cyprinidae	Minnow, Cutlips	Exoglossum maxillingua	24	5	29
Cyprinidae	Shiner, Common	Luxilus cornutus	318	1	319
Cyprinidae	Chub, River	Nocomis micropogon	1	0	1
Cyprinidae	Shiner, Golden	Notemigonus crysoleucas	0	1	1
Cyprinidae	Shiner, Comely	Notropis amoenus	47	0	47
Cyprinidae	Shiner, Spottail	Notropis hudsonius	432	94	526
Cyprinidae	Shiner, Rosyface	Notropis rubellus	6	0	6
Cyprinidae	Minnow, Bluntnose	Pimephales notatus	5564	1450	7014
Cyprinidae	Minnow, Fathead	Pimephales promelas	1	8	9
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	1213	0	1213
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	356	1	357
Cyprinidae	Chub, Creek	Semotilus atromaculatus	27	13	40
Fundulidae	Killifish, Banded	Fundulus diaphanus	31	1710	1741
Ictaluridae	Bullhead, Yellow	Ameiurus natalis	2	79	81
Ictaluridae	Madtom, Margined	Noturus insignis	34	0	34
Percidae	Darter, Greenside	Etheostoma blennioides	401	71	472
Percidae	Darter, Fantail	Etheostoma flabellare	398	21	419
Percidae	Darter, Tessellated	Etheostoma olmsted	76	8	84
<b>Total # Individuals</b>			12,892	3,959	16,851
<b>Total # Taxa</b>			30	21	31

Table 8. Fish Species Inventory and Capture Totals from Valley Forge National Historical Park in 2004.

FAMILY	COMMONNAME	LATINNAME	SCHR	Total
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	11	11
Clupeidae	Shad, American	Alosa sapidissima	3	3
Cyprinidae	Shiner, Satinfin	Cyprinella analostana	3	3
Cyprinidae	Shiner, Spottail	Notropis hudsonius	19	19
Ictaluridae	Catfish, Channel	Ictalurus punctatus	17	17
Ictaluridae	Catfish, Flathead	Pylodictus olivaris	3	3
Percidae	Darter, Tessellated	Etheostoma olmstedii	4	4
Rercidae	Darter, Shield	Percina peltata	1	1
<b>Total # Individuals</b>			61	61
<b>Total # Taxa</b>			8	8

Table 9. Fish Species Observed within Valley Forge National Historical Park in 2004.

FAMILY	COMMONNAME	LATINNAME	SCHR	Total
Anguillidae	Eel, American	Anguilla rostrata	6	6
Clupeidae	Shad, American	Alosa sapidissima	51	51
Cyprinidae	Carp, Common	Cyprinus carpio	69	69
Catostomidae	Sucker, White	Catostomus commersonii	1	1
Centrarchidae	Bass, Smallmouth	Micropterus dolomieu	1	1
Ictaluridae	Catfish, Channel	Ictalurus punctatus	23	23
Ictaluridae	Catfish, Flathead	Pylodictus olivaris	1	1
<b>Total # Individuals</b>			152	152
<b>Total # Taxa</b>			7	7

Table 10. Fish Species Inventory and Capture Totals from George Washington Birthplace National Monument in 2004.

FAMILY	COMMONNAME	LATINNAME	BRIDG	POPE_MY	POPE_AG	POPE_SP	POTR	Total
Anguillidae	Eel, American	Anguilla rostrata	0	1	2	0	0	3
Atherinidae	Silverside, Inland	Menidia beryllina	0	143	9	0	0	152
Atherinidae	Silverside, Atlantic	Menidia menidia	185	137	0	0	0	322
Belonidae	Needlefish, Atlantic	Strongylura marina	0	0	5	0	0	5
Centrarchidae	Sunfish, Bluespotted	Enneacanthus gloriosus	0	1	0	0	0	1
Centrarchidae	Pumpkinseed	Lepomis gibbosus	2	5	0	0	0	7
Centrarchidae	Bluegill	Lepomis macrochirus	0	2	1	0	0	3
Centrarchidae	Crappie, Black	Pomoxis nigromaculatus	1	0	0	0	0	1
Clupeidae	Alewife	Alosa pseudoharengus	0	0	15	0	0	15
Clupeidae	Menhaden, Atlantic	Brevoortia tyrannus	0	1	0	0	0	1
Clupidae	Shad, Gizzard	Dorosoma cepedianum	0	8	12	0	0	20
Cyprinidae	Carp, Common	Cyprinus carpio	0	2	0	0	0	2
Cyprinodontidae	Minnow, Sheepshead	Cyprinodon variegatus	0	1	0	0	0	1
Cyprinodontidae	Killifish, Striped	Fundulus majalis	0	1	0	0	0	1
Engraulidae	Anchovy, Bay	Anchoa mitchilli	0	1	3	0	0	4
Fundulidae	Killifish, Banded	Fundulus diaphanus	0	1	1	0	0	2
Fundulidae	Mummichog	Fundulus heteroclitus	23	102	1	0	0	126
Gobiidae	Goby, Naked	Gobiosoma bosc	0	1	0	0	0	1
Ictaluridae	Catfish, White	Ameiurus catus	0	0	0	1	0	1
Ictaluridae	Bullhead, Brown	Ameiurus nebulosus	0	2	1	0	0	3
Ictaluridae	Catfish, Channel	Ictalurus punctatus	0	1	5	4	0	10
Moronidae	Perch, White	Morone americana	41	871	961	49	229	2151
Moronidae	Bass, Striped	Morone saxatilis	34	63	123	24	5	249
Paralichthyidae	Flounder, Summer	Paralichthys dentatus	0	1	8	0	1	10
Percidae	Perch, Yellow	Perca flavescens	0	1	1	0	0	2
Poeciliidae	Mosquitofish, Eastern	Gambusia holbrooki	9	0	0	0	0	9
Pomatomidae	Bluefish	Pomatomus saltatrix	0	0	2	4	0	6
Sciaenidae	Spot	Leiostomus xanthurus	0	4	11	0	0	15
Soleidae	Hogchoker	Trinectes maculatus	0	2	9	0	0	11
Syngnathidae	Pipefish, Northern	Syngnathus fuscus	0	6	0	0	0	6
<b>Total # Individuals</b>			295	1358	1170	82	235	3140
<b>Total # Taxa</b>			7	24	18	5	3	30

Table 11. Cumulative Fish Species Inventory and Capture Totals by Park during all Years: 2002 - 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	HOFU	RICH	PETE	GEWA	THST	Total
Amiidae	Bowfin	<i>Amia calva</i>	0	0	0	0	0	0	0	0	3	0	0	3
Anguillidae	Eel, American	<i>Anguilla rostrata</i>	3	0	240	0	1	0	1	79	12	4	1	341
Aphredoderidae	Perch, Pirate	<i>Aphredoderus sayanus</i>	96	0	147	0	0	0	0	147	2	0	0	392
Atherinidae	Silverside, Atlantic	<i>Menidia menidia</i>	0	0	0	0	0	0	0	0	0	322	0	322
Atherinidae	Silverside, Inland	<i>Menidia beryllina</i>	0	0	0	0	0	0	0	0	0	152	0	152
Belonidae	Needlefish, Atlantic	<i>Strongylura marina</i>	0	0	0	0	0	0	0	0	0	6	0	6
Catostomidae	Chubsucker, Creek	<i>Erimyzon oblongus</i>	116	0	260	0	0	2	0	86	47	0	0	511
Catostomidae	Hogsucker, Roanoke	<i>Hypentelium roanokense</i>	0	16	0	0	0	0	0	0	0	0	0	16
Catostomidae	Jumprock, Bigeye	<i>Scartomyzon ariommus</i>	0	1	0	0	0	0	0	0	0	0	0	1
Catostomidae	Jumprock, Black	<i>Scartomyzon cervinus</i>	0	114	0	0	0	0	0	0	0	0	0	114
Catostomidae	Quillback	<i>Carpiodes cyprinus</i>	0	40	0	0	0	0	0	0	0	0	0	40
Catostomidae	Redhorse, Golden	<i>Moxostoma erythrurum</i>	0	1	0	0	0	0	0	0	0	0	0	1
Catostomidae	Redhorse, Shorthead	<i>Moxostoma macrolepidotum</i>	0	26	0	0	0	0	0	0	0	0	0	26
Catostomidae	Redhorse, Silver	<i>Moxostoma anisurum</i>	0	23	0	0	0	0	0	0	0	0	0	23
Catostomidae	Redhorse, V-lip	<i>Moxostoma pappillosum</i>	0	29	0	0	0	0	0	0	0	0	0	29
Catostomidae	Hogsucker, Northern	<i>Hypentelium nigricans</i>	4	19	0	0	9	0	0	0	0	0	0	32
Catostomidae	Sucker, Torrent	<i>Moxostoma rathoeum</i>	117	0	0	0	0	0	0	0	0	0	0	117
Catostomidae	Sucker, White	<i>Catostomus commersonii</i>	137	38	228	138	136	175	12	0	0	0	0	864
Centrarchidae	Bass, Largemouth	<i>Micropterus salmoides</i>	5	32	64	7	83	5	1	20	13	0	5	235
Centrarchidae	Bass, Rock	<i>Ambloplites rupestris</i>	0	0	1	0	4	30	0	4	0	0	0	39
Centrarchidae	Bass, Smallmouth	<i>Micropterus dolomieu</i>	9	0	2	0	3	39	0	0	0	0	0	53
Centrarchidae	Bluegill	<i>Lepomis macrochirus</i>	75	77	866	25	43	26	6	420	83	14	9	1644
Centrarchidae	Crappie, Black	<i>Pomoxis nigromaculatus</i>	0	0	1	0	6	0	0	2	11	1	0	21
Centrarchidae	Crappie, White	<i>Pomoxis annularis</i>	0	4	76	0	0	0	0	16	0	0	0	96
Centrarchidae	Flier	<i>Centrarchus macropterus</i>	0	0	1	0	0	0	0	149	13	0	0	163
Centrarchidae	Pumpkinseed	<i>Lepomis gibbosus</i>	71	4	1692	30	39	32	0	100	1	9	0	1978
Centrarchidae	Spotted Bass	<i>Micropterus punctulatus</i>	0	0	0	0	0	0	0	1	0	0	0	1
Centrarchidae	Sunfish, Bluespotted	<i>Enneacanthus gloriosus</i>	0	3	760	0	0	0	0	88	12	1	0	864
Centrarchidae	Sunfish, Green	<i>Lepomis cyanellus</i>	0	9	79	235	381	77	0	1	0	0	0	782
Centrarchidae	Sunfish, Mud	<i>Acantharchus pomotis</i>	0	0	432	0	0	0	0	25	2	0	0	459
Centrarchidae	Sunfish, Redbreast	<i>Lepomis auritus</i>	238	450	95	8	26	1	0	25	1	0	0	844

Table 11 Continued. Cumulative Fish Species Inventory and Capture Totals by Park during all Years: 2002 - 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	HOFU	RICH	PETE	GEWA	THST	Total
Centrarchidae	Warmouth	Lepomis gulosus	0	0	20	0	0	0	0	46	8	3	0	77
Clupeidae	Alewife	Alosa pseudoharengus	0	0	0	0	0	0	0	0	0	16	0	16
Clupeidae	Menhaden, Atlantic	Brevoortia tyrannus	0	0	0	0	0	0	0	0	0	1	0	1
Clupeidae	Shad, American	Alosa sapidissima	0	0	0	0	0	3	0	0	0	0	0	3
Clupidae	Shad, Gizzard	Dorosoma cepedianum	0	0	1	0	0	0	0	6	0	20	0	27
Cottidae	Sculpin, Mottled	Cottus bairdii	0	0	3	0	0	0	0	0	0	0	0	3
Cyprinidae	Carp, Common	Cyprinus carpio	0	2	2	0	0	0	0	0	0	26	0	30
Cyprinidae	Chub, Bluehead	Nocomis leptocephalus	334	1159	355	0	0	0	0	5	0	0	0	1853
Cyprinidae	Chub, Creek	Semotilus atromaculatus	87	66	45	504	40	13	90	8	40	0	5	898
Cyprinidae	Chub, River	Nocomis micropogon	0	0	0	0	1	0	0	0	0	0	0	1
Cyprinidae	Dace, Blacknose	Rhinichthys atratulus	60	0	172	1105	1213	304	272	0	354	0	178	3658
Cyprinidae	Dace, Longnose	Rhinichthys cataractae	4	0	45	11	357	78	0	0	0	0	0	495
Cyprinidae	Dace, Mountain Redbelly	Phoxinus oreas	304	120	0	0	0	0	0	0	0	0	0	424
Cyprinidae	Dace, Rosyside	Clinostomus funduloides	85	142	50	0	0	0	42	7	104	0	3	433
Cyprinidae	Fallfish	Semotilus corporalis	21	0	364	0	0	0	32	0	0	0	2	419
Cyprinidae	Minnow, Bluntnose	Pimephales notatus	1	9	0	318	7014	13	0	0	0	0	0	7355
Cyprinidae	Minnow, Cutlips	Exoglossum maxillingua	36	0	0	0	29	196	10	0	0	0	0	271
Cyprinidae	Minnow, Eastern Silvery	Hybognathus regius	0	0	174	12	0	0	0	0	0	0	0	186
Cyprinidae	Minnow, Fathead	Pimephales promelas	0	0	0	0	9	4	0	0	0	0	0	13
Cyprinidae	Minnow, Silverjaw	Ericymba buccata	0	0	9	0	0	0	0	0	0	0	0	9
Cyprinidae	Shiner, Comely	Notropis amoenus	0	0	0	0	47	0	0	0	0	0	0	47
Cyprinidae	Shiner, Common	Luxilus cornutus	658	0	106	0	319	60	0	0	0	0	0	1143
Cyprinidae	Shiner, Crescent	Luxilus cerasinus	0	401	0	0	0	0	0	0	0	0	0	401
Cyprinidae	Shiner, Golden	Notemigonus crysoleucas	0	0	1382	24	1	0	0	192	150	3	0	1752
Cyprinidae	Shiner, Ironcolor	Notropis chalybaeus	0	0	0	0	0	0	0	21	0	0	0	21
Cyprinidae	Shiner, Rosefin	Lythrurus ardens	166	264	0	0	0	0	0	0	0	0	0	430
Cyprinidae	Shiner, Rosyface	Notropis rubellus	0	0	0	0	6	0	0	0	0	0	0	6
Cyprinidae	Shiner, Satinfin	Cyprinella analostana	0	160	50	1	0	3	0	0	0	0	0	214
Cyprinidae	Shiner, Spotfin	Cyprinella spiloptera	0	0	0	0	42	31	0	0	0	0	0	73
Cyprinidae	Shiner, Spottail	Notropis hudsonius	0	76	0	0	526	31	0	0	0	0	0	633
Cyprinidae	Shiner, Swallowtail	Notropis procne	150	6	26	0	0	0	0	0	0	0	0	182

Table 11 Continued. Cumulative Fish Species Inventory and Capture Totals by Park during all Years: 2002 - 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	HOFU	RICH	PETE	GEWA	THST	Total
Cyprinidae	Shiner, White	<i>Luxilus albeolus</i>	0	5	0	0	0	0	0	0	0	0	0	5
Cyprinidae	Stoneroller, Central	<i>Campostoma anomalum</i>	140	88	0	42	3685	0	0	0	0	0	0	3955
Cyprinodontidae	Killifish, Striped	<i>Fundulus majalis</i>	0	0	0	0	0	0	0	0	0	1	0	1
Cyprinodontidae	Minnow, Sheepshead	<i>Cyprinodon variegatus</i>	0	0	0	0	0	0	0	0	0	1	0	1
Engraulidae	Anchovy, Bay	<i>Anchoa mitchilli</i>	0	0	0	0	0	0	0	0	0	82	0	82
Esocidae	Pickeral, Chain	<i>Esox niger</i>	3	0	13	0	0	0	3	60	12	1	0	92
Fundulidae	Killifish, Banded	<i>Fundulus diaphanus</i>	0	0	0	2	1741	0	0	0	0	34	0	1777
Fundulidae	Mummichog	<i>Fundulus heteroclitus</i>	0	0	0	0	0	0	0	0	0	140	0	140
Gobiidae	Goby, Naked	<i>Gobiosoma bosc</i>	0	0	0	0	0	0	0	0	0	1	0	1
Ictaluridae	Bullhead, Brown	<i>Ameiurus nebulosus</i>	0	0	184	0	0	7	0	0	0	8	0	199
Ictaluridae	Bullhead, Yellow	<i>Ameiurus natalis</i>	0	0	13	5	81	0	8	17	0	0	0	124
Ictaluridae	Catfish, Channel	<i>Ictalurus punctatus</i>	0	0	0	0	0	17	0	0	0	11	0	28
Ictaluridae	Catfish, Flathead	<i>Pylodictus olivaris</i>	0	0	0	0	0	3	0	0	0	0	0	3
Ictaluridae	Catfish, White	<i>Ameiurus catus</i>	0	0	0	0	0	0	0	0	0	1	0	1
Ictaluridae	Madtom, Margined	<i>Noturus insignis</i>	43	111	2	0	34	0	10	13	0	0	0	213
Moronidae	Bass, Striped	<i>Morone saxatilis</i>	0	0	0	0	0	0	0	0	0	268	0	268
Moronidae	Perch, White	<i>Morone americana</i>	0	1	0	0	0	0	0	0	0	2425	0	2426
Paralichthyidae	Flounder, Summer	<i>Paralichthys dentatus</i>	0	0	0	0	0	0	0	0	0	10	0	10
Percidae	Darter, Fantail	<i>Etheostoma flabellare</i>	78	38	0	58	419	0	0	0	0	0	0	593
Percidae	Darter, Greenside	<i>Etheostoma blennioides</i>	0	0	0	62	472	0	0	0	0	0	0	534
Percidae	Darter, Johnny	<i>Etheostoma nigrum</i>	296	4	0	0	0	0	0	0	0	0	0	300
Percidae	Darter, Longfin	<i>Etheostoma longimanum</i>	14	0	0	0	0	0	0	0	0	0	0	14
Percidae	Darter, Riverweed	<i>Etheostoma podostemone</i>	0	22	0	0	0	0	0	0	0	0	0	22
Percidae	Darter, Stripeback	<i>Percina notogramma</i>	20	0	1	0	0	0	0	0	0	0	0	21
Percidae	Darter, Swamp	<i>Etheostoma fusiforme</i>	0	0	0	0	0	0	0	13	0	0	0	13
Percidae	Darter, Tessellated	<i>Etheostoma olmsted</i>	0	0	145	0	84	55	8	4	0	0	0	296
Percidae	Perch, Yellow	<i>Perca flavescens</i>	0	4	0	0	0	0	0	0	0	5	0	9
Petromyzontidae	Lamprey, Least Brook	<i>Lampetra aepyptera</i>	0	0	0	0	0	0	0	21	17	0	0	38
Petromyzontidae	Lamprey, Sea	<i>Petromyzon marinus</i>	0	0	5	0	0	0	0	0	3	0	0	8
Poeciliidae	Mosquitofish, Eastern	<i>Gambusia holbrooki</i>	0	0	124	0	0	0	0	184	92	9	0	409
Pomatomidae	Bluefish	<i>Pomatomus saltatrix</i>	0	0	0	0	0	0	0	0	0	8	0	8

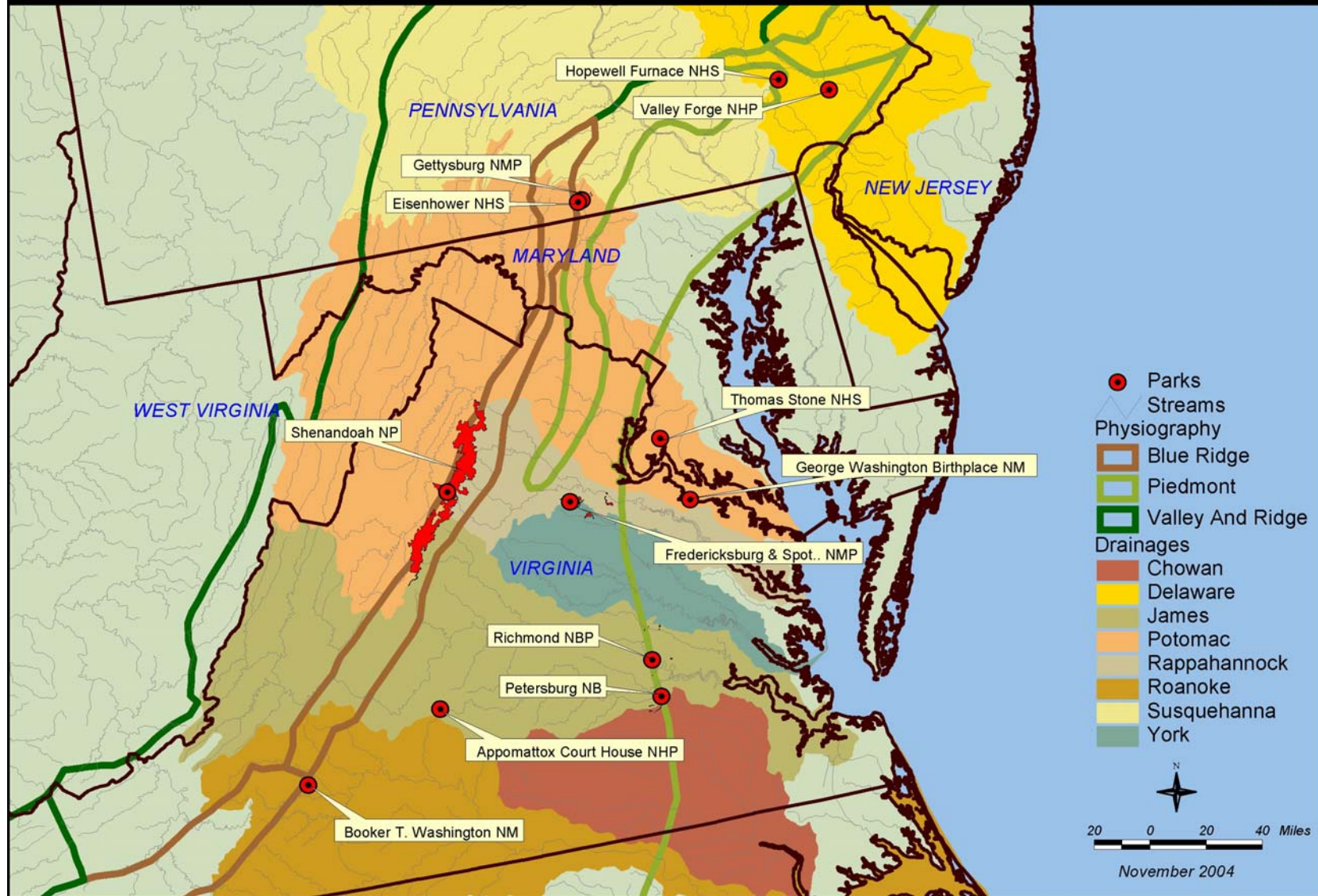
Table 11 Continued. Cumulative Fish Species Inventory and Capture Totals by Park during all Years: 2002 - 2004

FAMILY	COMMONNAME	LATINNAME	APCO	BOWA	FRSP	GETT	EISE	VAFO	HOFU	RICH	PETE	GEWA	THST	Total
Rercidae	Darter, Shield	Percina peltata	0	0	0	0	0	1	0	0	0	0	0	1
Salmonidae	Trout, Brook	Salvelinus fontinalis	0	0	0	0	0	0	7	0	0	0	0	7
Salmonidae	Trout, Brown	Salmo trutta	0	0	0	0	0	63	0	0	0	0	0	63
Sciaenidae	Spot	Leiostomus xanthurus	0	0	0	0	0	0	0	0	0	19	0	19
Soleidae	Hogchoker	Trinectes maculatus	0	0	0	0	0	0	0	0	0	14	0	14
Syngnathidae	Pipefish, Northern	Syngnathus fuscus	0	0	0	0	0	0	0	0	0	6	0	6
Umbridae	Mudminnow, Eastern	Umbra pygmaea	0	0	87	0	0	0	0	308	1	1	735	1132
<b>Total # Individuals</b>			3371	3564	8322	2587	16851	1269	502	2068	981	3623	938	44076
<b>Total # Taxa</b>			<b>30</b>	<b>36</b>	<b>41</b>	<b>18</b>	<b>31</b>	<b>26</b>	<b>14</b>	<b>30</b>	<b>22</b>	<b>34</b>	<b>8</b>	<b>100</b>

## **Maps**

Fish Inventories of Mid-Atlantic &  
Northeast Coastal and Barrier Network Parks

National Park Service  
U.S. Department of the Interior








## Maps

### -- Legend --

#### Sampling Sites

-  Transect Start
-  Transect End
-  Sample Point

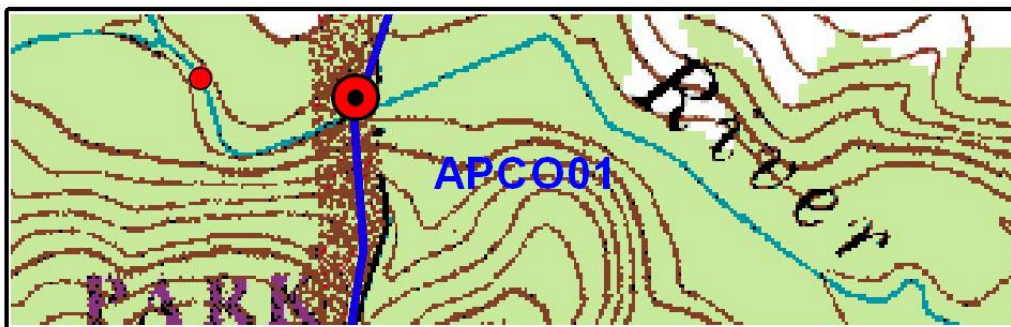
#### Other Sites

-  Transect Start
-  Transect End
-  Sample Point
-  Transects
-  NPS Boundary

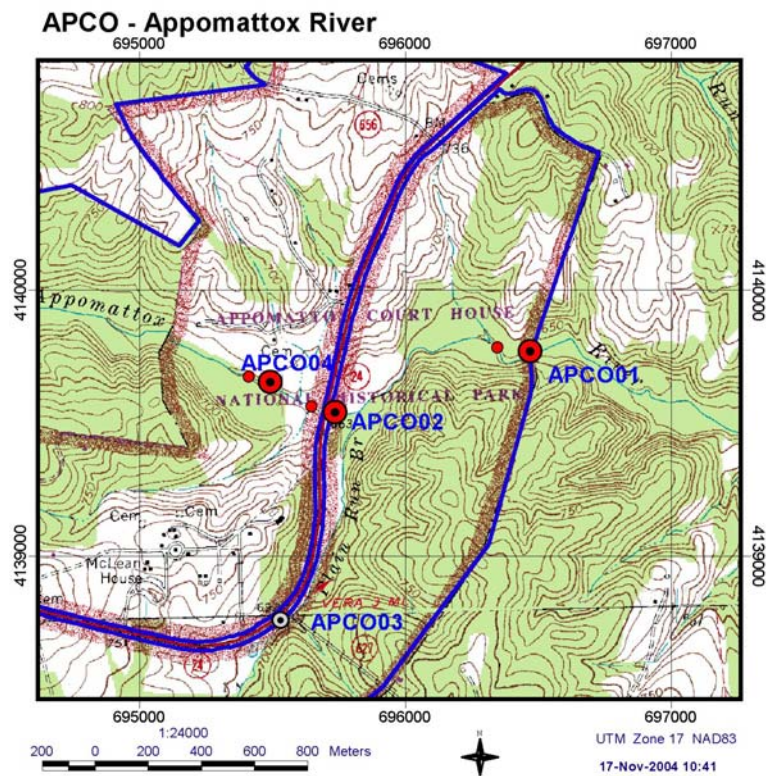


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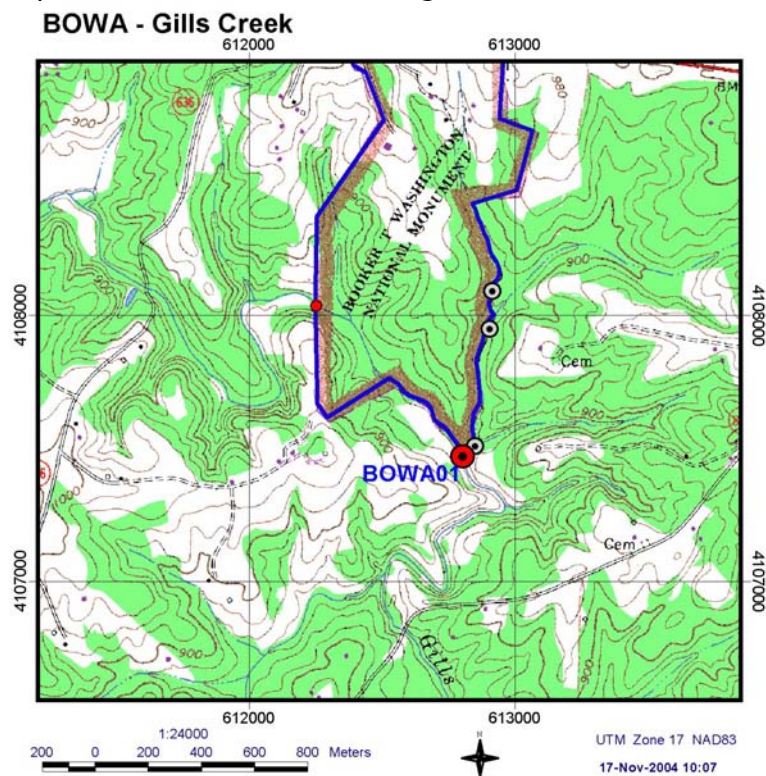
Topographic Maps (DRGs)



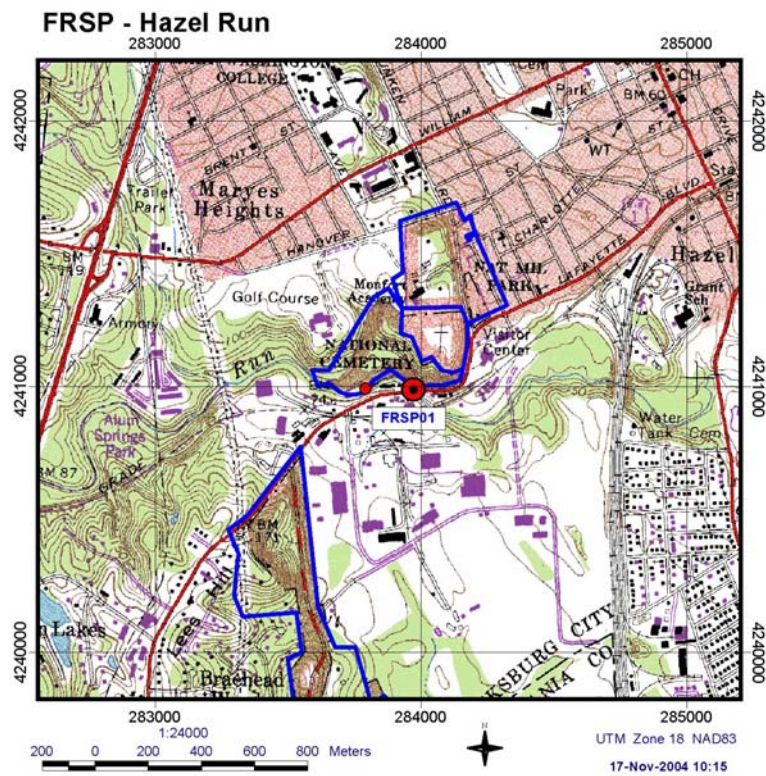
Map 1: Park: Appomattox Court House National Historical Park



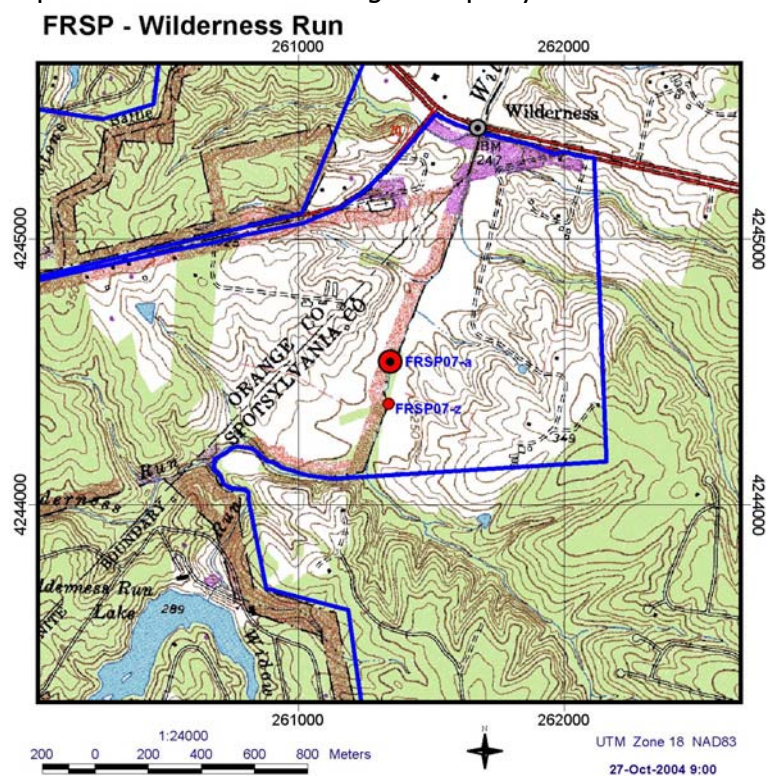
Map 2: Park: Booker T. Washington National Monument



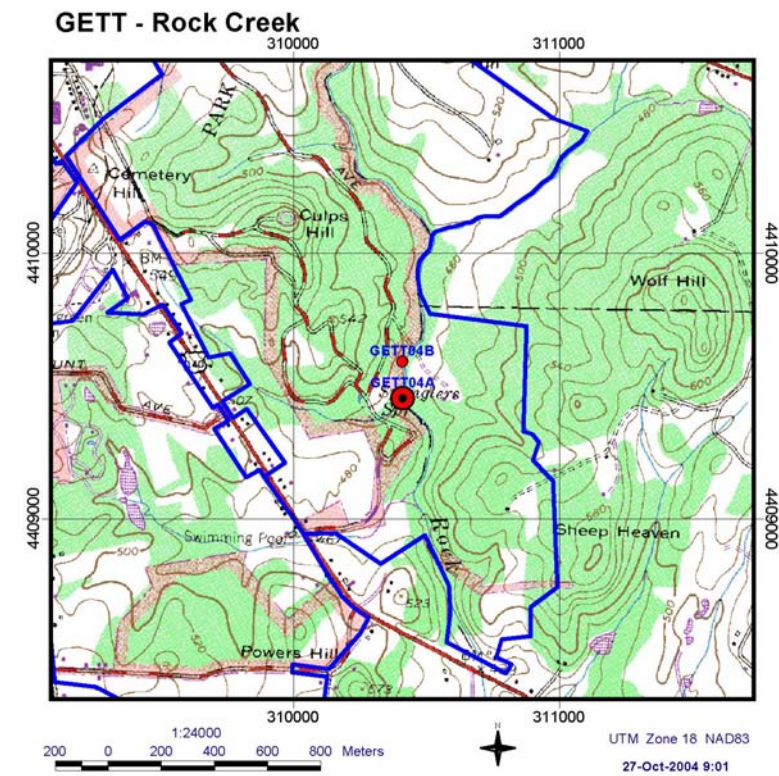
Map 3: Park: Fredericksburg and Spotsylvania National Military Park



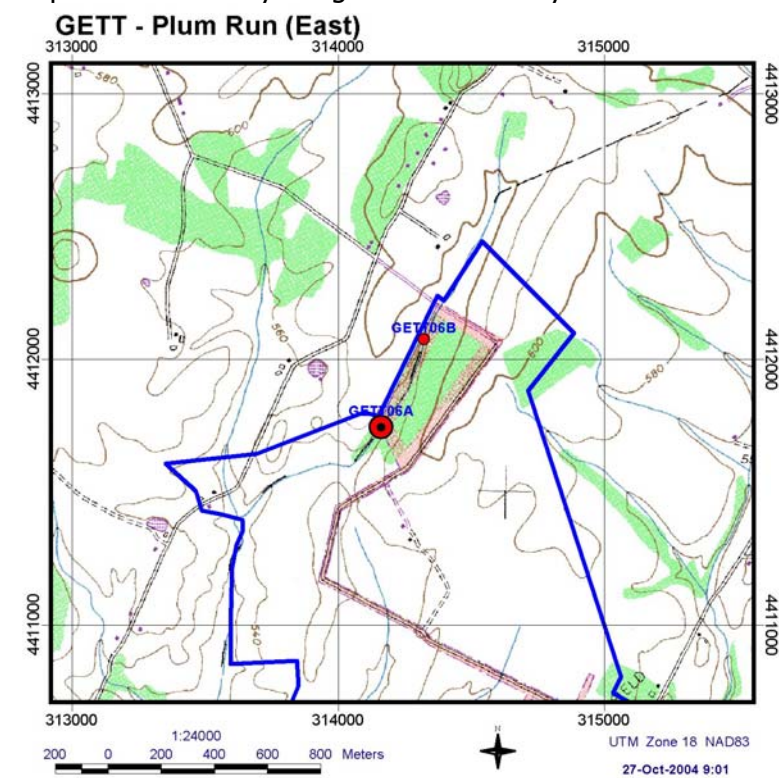
Map 4: Park: Fredericksburg and Spotsylvania National Military Park



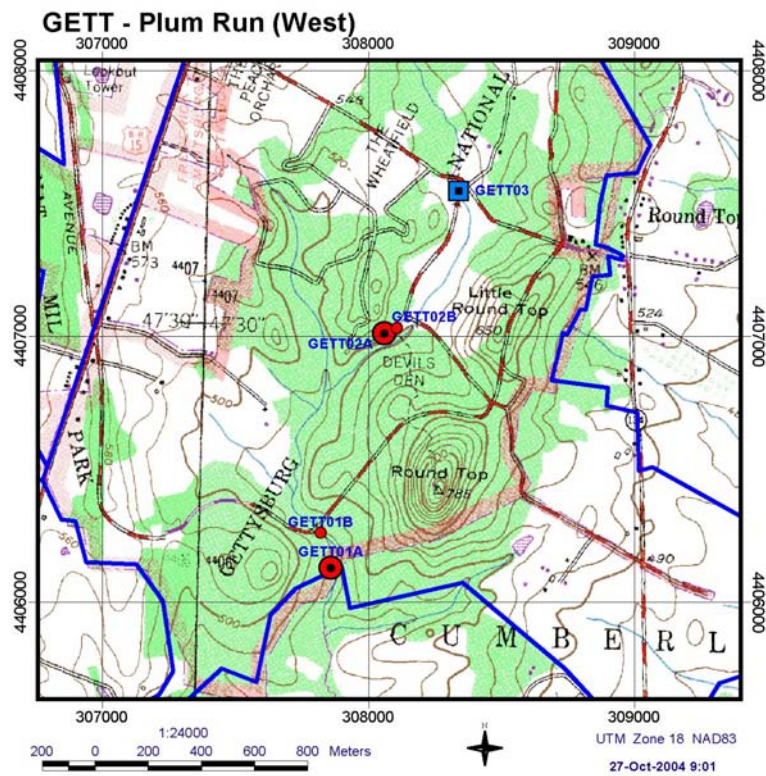
Map 5: Park: Gettysburg National Military Park



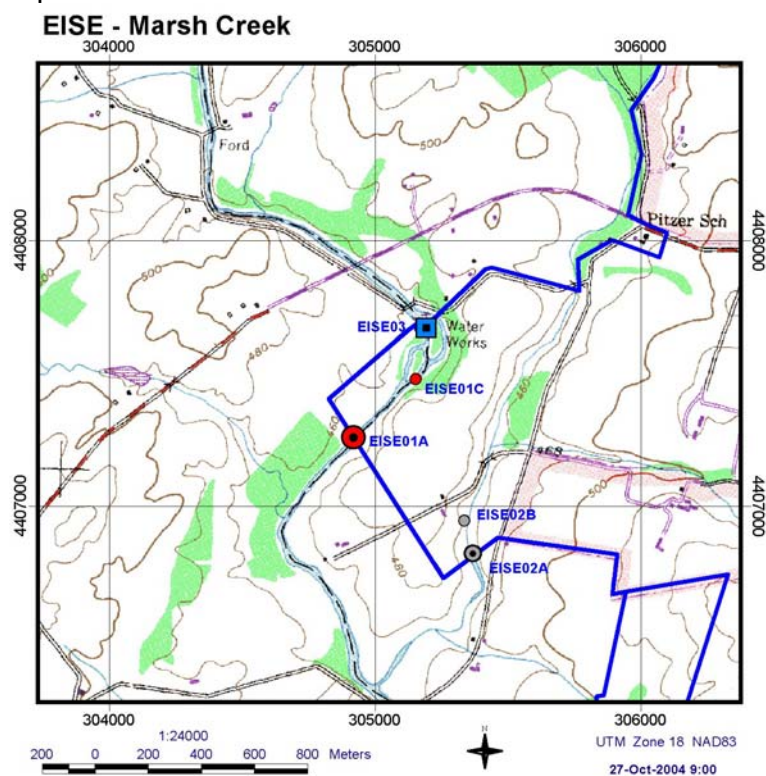
Map 6: Park: Gettysburg National Military Park



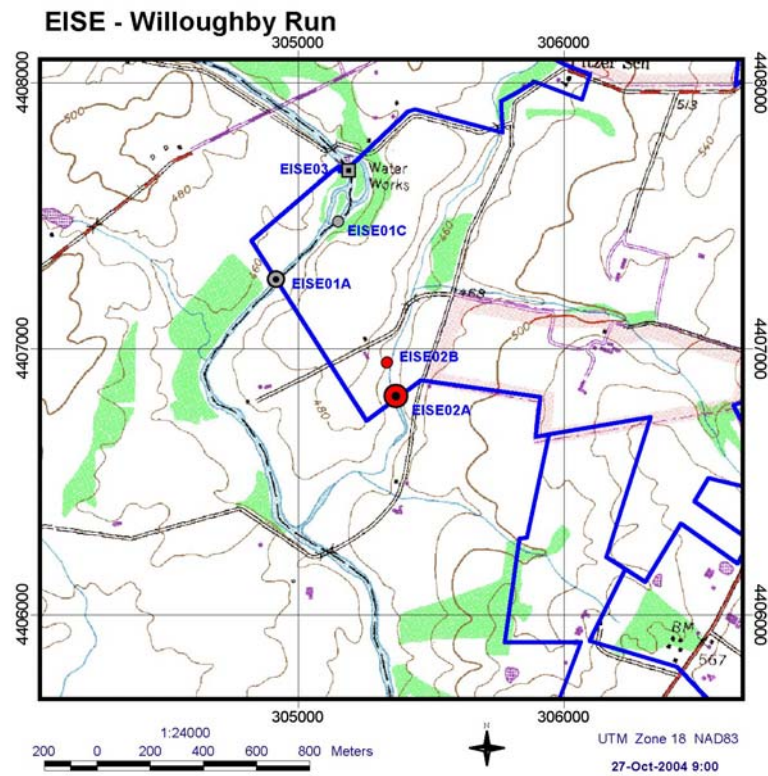
Map 7: Park: Gettysburg National Military Park



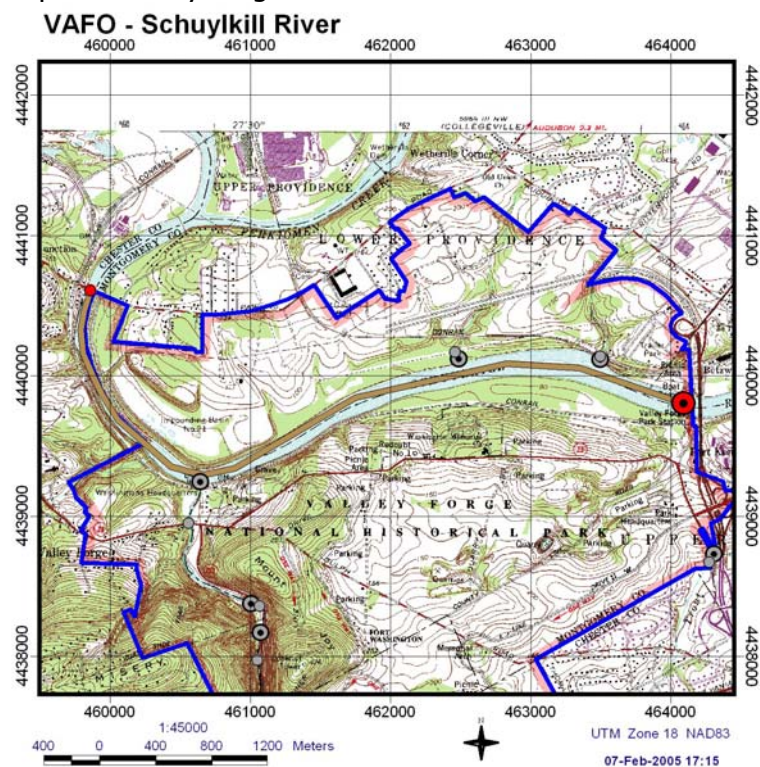
Map 8: Park: Eisenhower National Historic Site



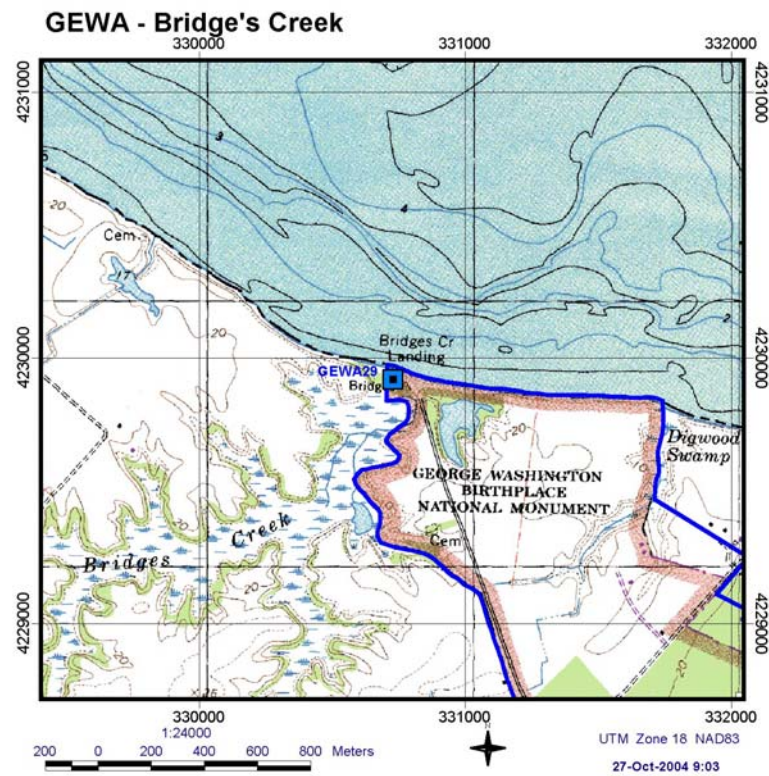
Map 9: Park: Eisenhower National Historic Site



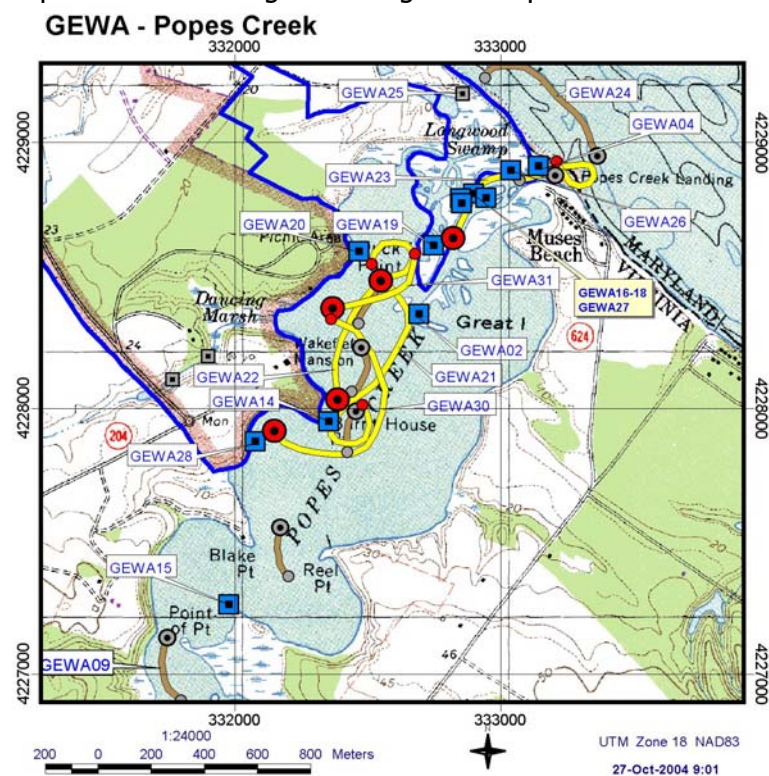
Map 10: Valley Forge National Historical Park



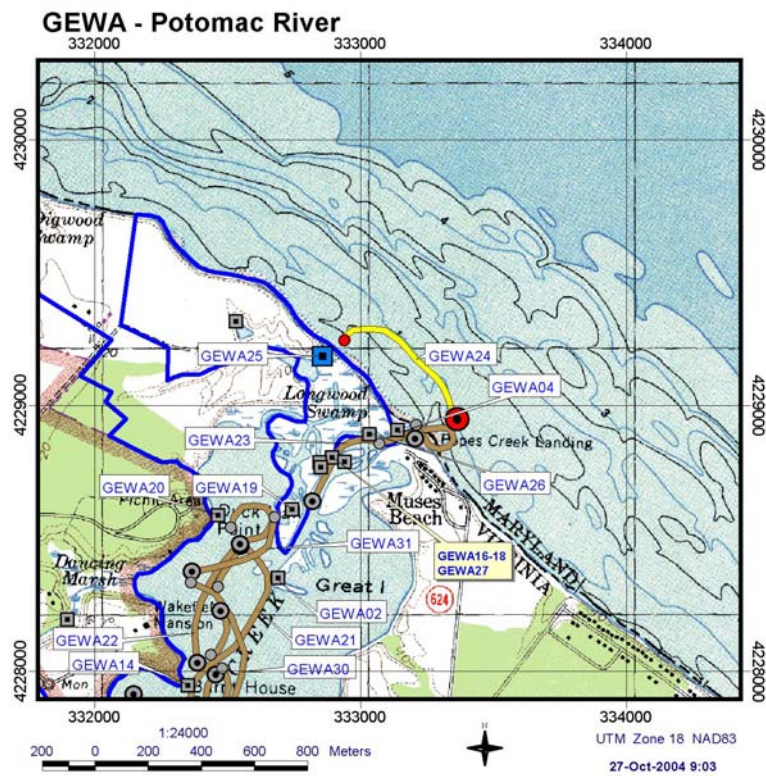
Map 11: Park: George Washington Birthplace National Monument



Map 12: Park: George Washington Birthplace National Monument



Map 13: Park: George Washington Birthplace National Monument



## **Appendices**

### Appendix A: List of Fish Species Collected

Date	Species	Number	Stream	Park
20-May-04	Bigeye Jumprock	1	Gill's Creek	BOWA
20-May-04	V-lip Redhorse	1	Gill's Creek	BOWA
20-May-04	Shorthead Redhorse	1	Gill's Creek	BOWA
20-May-04	Green Sunfish	1	Gill's Creek	BOWA
20-May-04	Spottail Shiner	2	Gill's Creek	BOWA
20-May-04	Johnny Darter	1	Gill's Creek	BOWA
25-May-04	Atlantic Menhaden	1	Pope's Creek	GEWA
25-May-04	Inland Silverside	6	Pope's Creek	GEWA
25-May-04	Striped Killifish	1	Pope's Creek	GEWA
25-May-04	Sheepshead Minnow	2	Pope's Creek	GEWA
25-May-04	Naked Goby	1	Pope's Creek	GEWA
25-May-04	Banded Killifish	1	Pope's Creek	GEWA
25-May-04	Mummichog	2	Pope's Creek	GEWA
25-May-04	Summer Flounder	1	Pope's Creek	GEWA
25-May-04	Northern Pipefish	5	Pope's Creek	GEWA
26-May-04	Atlantic Silverside	8	Pope's Creek	GEWA
26-May-04	Bay Anchovy	1	Pope's Creek	GEWA
26-May-04	Spot	2	Pope's Creek	GEWA
17-Aug-04	Rosyface Shiner	1	Marsh Creek	EISE
17-Aug-04	Comely Shiner	11	Marsh Creek	EISE
17-Aug-04	Spotfin Shiner	1	Marsh Creek	EISE
17-Aug-04	Greenside Darter	5	Marsh Creek	EISE
18-Aug-04	Eastern Silvery Minnow	5	Rock Creek	GETT
18-Aug-04	Satinfin Shiner	1	Rock Creek	GETT
18-Aug-04	Fathead Minnow	5	Willoughby Run	EISE
25-Aug-04	Alewife	3	Pope's Creek	GEWA
25-Aug-04	Atlantic Menhaden	1	Pope's Creek	GEWA
25-Aug-04	Striped Killifish	4	Pope's Creek	GEWA
25-Aug-04	Atlantic Needlefish	1	Pope's Creek	GEWA
26-Aug-04	Black Crappie	1	Bridges's Creek	GEWA
22-Sep-04	Fallfish	11	Hazel Run	FRSP
22-Sep-04	Swallowtail Shiner	4	Hazel Run	FRSP
22-Sep-04	Satinfin Shiner	1	Hazel Run	FRSP
22-Sep-04	Silverjaw Minnow	4	Hazel Run	FRSP
22-Sep-04	Eastern Silvery Minnow	1	Hazel Run	FRSP
22-Sep-04	Sea Lamprey	2	Hazel Run	FRSP

## Appendix B: Breakdown of Budget by type of Expenditure

Expenditures	Funding Source		
	Park Base	Mid Atlantic Network	Coast & Bar Network
<b>Personnel</b>			
Wildlife/Fisheries Biologist (3.0 pp)	\$8,631.00		
Lead Biological Technician (2.0 pp)	\$5,444.00		
GS-5 Biol. Tech. (2.0 pp)	\$2,215.00		
GS-5 Biol. Tech. (2.0 pp)	\$2,215.00		
GS-5 Biol. Tech. (1.0 pp)	\$1,107.00		
GS-4 Biol. Tech. (2.0 pp)	\$1,969.00		
GS-4 Biol. Tech. (1.0 pp)	\$984.00		
<b>Travel (Per Diem)</b>			
Crew of 5 (APCO & BOWA)		\$962.00	
Crew of 5 (GEWA - May)			\$993.00
Crew of 9 (GETT & EISE)		\$3,371.00	
Crew of 9 (GEWA - Aug)			\$1,691.00
<b>Coop Agreements (USFWS)</b>			\$5,756.00
<b>Totals</b>	\$21,581.00	\$4,333.00	\$8,440.00

## Appendix C: Photographs



Multi-agency electrofishing survey within Gill's Creek, Booker T. Washington National Monument.



Electrofishing survey in the Devil's Den section of Plum Run, Gettysburg National Military Park.



Multi-agency electrofishing survey of Marsh Creek, Eisenhower National Historic Site.



A fyke net set within Pope's Creek, George Washington Birthplace National Monument.



Seining fish near the entrance to Pope's Creek, George Washington Birthplace National Monument.



Measuring fish within Pope's Creek, George Washington Birthplace National Monument.



Large channel catfish captured within the entrance of Pope's Creek, George Washington Birthplace National Monument.